

ADMIN.

Protect your helicopter with BearPaws



BearPaws

For **R44, AS350, EC130**

BP44, BP350, BP130

**Perform Safe landings on *Snow*, on *Clear Ice*,
as well as on *Spongy Soils* & in *Rivers***

**Helitowcart BearPaws offer
*Great Quality at an Affordable Price***

Efficient Design

- 1) Pad shape streamlined to allow dust & gravel to easily flow off
- 2) Pad with flow holes to allow water release when taking off from rivers
- 3) Pad shape reinforced at rear for long term durability of landing contact point

Sturdy Construction

- 1) Sturdy Attachment Clips made of 14ga Stainless Steel
- 2) Pads made of Long Lasting UHMW-Polymer for best sturdiness-flexibility ratio
- 3) Pads profile optimized through finite element analysis to obtain best lightweight-strength ratio



Iceblades: Helitowcart introduced iceblades for bearpaws to provide better traction on clear ice. This reduces risks of helicopter skidding on ice. Iceblades also offer extra protection to pads especially for helicopters used for training. Iceblades are included with the BearPaw kit.

Models:	BP44	BP350	BP130
For	R44	AS350, AS355	EC130
			
	New Larger Pad		New for EC130
STCs	Canada : Q-SH-06-24 United States: SR02432NY Australia & New Zealand: Use US STC	Canada : Q-SH-06-24 United States: SR02432NY Australia & New Zealand: Use US STC	Canada : Q-SH-06-24 United States: SR02432NY Australia & New Zealand: Use US STC
P/N Name: Weight	112 0001 00 C BP44 Bearpaws 6.9 lbs / 3.1 kg	112 0002 00 B BP350 Bearpaws 18.3 lbs / 8.5kg	112 0005 00 A BP130 Bearpaws 20 lbs / 9.1kg



HELI
TOW CART

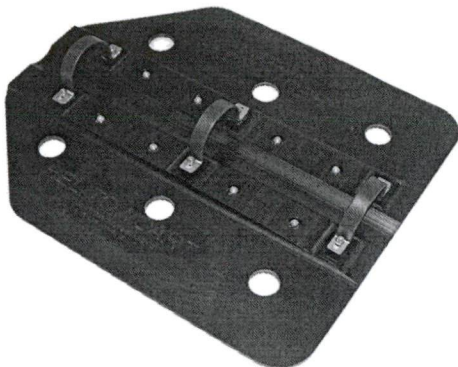
By Vanair

☐ BP350 BearPaw (2)

☐ BP130 BearPaw (2)

877A Alphonse-Desrochers, Saint-Nicholas, Levis, Quebec, Canada G7A 5K6 / Made in Canada
www.helitowcart.com +1.418.561.4512 info@helitowcart.com

htc 273-0002-04-D



HELI
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☐ BP350 BearPaw (2)

☐ BP130 BearPaw (2)

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htc 273-0002-04-D

1- Install Shrink:

- Prepare Heat Shrink:


BP44 & BP66: Use ~~transparent~~ shrink (~~black authorized if transparent is not available~~).
Use ^{1.5"} 1" wide shrink. Cut to ^{5.5"} 5" length.

BP350 & BP130: Use ~~black~~ shrink (~~transparent authorized if black is not available~~).
Use ^{1.5"} 1" wide shrink. Cut to ^{6.75"} 6.25" length.

- Insert U clips into shrink. (~~if applicable: Use soapy water to help insertion~~)
- Set U clips on their side on aluminum sheet on cookie pan
- Heat oven at 350F for 30 min.

2P
2016 06 10

Nature modifications: Complete update of instruction


2016 12 10

1- Inspecter composantes fabriquées: (Par Quality System Manager)

- Utiliser formulaire F30-01 Receiving Inspection General
- Prendre connaissance des données d'inspection des fabricants
- Utiliser plan d'inspection prescrit (modifier le plan d'inspection au besoin)
- Assigner no de lot "LN-yymmdd-xx". (xx étant le séquentiel).
- Identifier le contenant avec le no de lot assigné, le P/N de la pièce et la quantité
- Ranger en zone de storage des pièces de BearPaws

change text
to english! ☺

2- Effectuer emballage des kits: (Par Quality System Manager)

- Insérer toutes les petites composantes dans des sacs
- Insérer les deux Pads de bearpaws ainsi que les sacs de composantes dans la boîte appropriée
- Bourrer contenu de la boîte de papier protecteur (si applicable)
- Apposer étiquette d'identification du type de produit sur la boîte. Cocher le produit applicable.

3- Effectuer assemblage documentaire: (Par Quality System Manager)

- Assembler dans sacs :
 - (1) Master Document List (MDL)
 - (2) Instruction d'installation du produit
 - ~~(3) Certificat de manufacturier SH06-24~~
 - (4) STC Transport Canada
 - (5) STC FAA USA

D.R. 2010 06 10


4- Inspecter produit fini: (Par Quality System Manager)

- Utiliser formulaire F40-02 Release Inspection General
- Utiliser plan d'inspection prescrit et modifier le plan d'inspection au besoin
- Effectuer les contrôles prescrits et Enregistrer résultats.
- Enregistrer données de traçabilité des composantes utilisées (utiliser tableau en annexe si trop de données de sous lots pour le tableau situé sur le formulaire F40-02)
- Assigner no de lot "LNF-yymmdd-xx". (xx étant le séquentiel).
- Émettre certificat de relâche temporaire pour chaque kit (F40-01 Authorized Release Certificate)
- Identifier au marqueur chaque boîte avec le no LNF et son no de kit (séquentiel), (no doit être bien en vue lorsque les boîtes sont mises prêtes à expédier)
- Apposer le formulaire F40-01 Release Certificate temporaire avec le bon séquentiel sur le rebord de chaque boîte (facilement détachable pour émettre le certificat en version finale au moment venu)
- Ranger les kits assemblés dans la zone de storage des bearpaws prêts à vendre

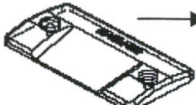
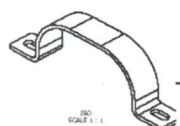

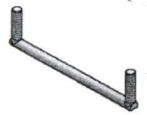


5- Au moment de la vente: (Par Quality System Manager)

- Émettre certificat de relâche officiel (F40-01 Authorized Release Certificate).
Réaliser le certificat sur format électronique (Données électroniques localisées à : Quality System/ Official Records/ Release Certificates), le nommer avec le no de facture et nom de l'acheteur. Mettre en pied de page le nom du fichier créé. Imprimer. Signer ce certificat original.
- Conserver une copie du certificat signé au DHR avec la copie temporaire, classer par ordre de no de lot.
- Insérer l'originale signée dans le sac de documents dans la boîte à expédier.

Nature de la modification de l'instruction : Revue en profondeur de la méthode de travail.


2011 12 10

314-0010-00-i
Bearpaws Parts List

			Quantities per PAIR		
	Part Name	HTC P/N	BP44	BP350	BP130
PADS	Pad /BP44	314-0001-01	2		
	Pad /BP350	314-0018-01		2	
	Pad /BP130	314-0024-01			2
HARDWARE	Plastic bag 8x10	na	2	2	2
	 Rear Filler block/BP44	314-0022-01	2		
	U-Clip / BP44	314-0006-15	4		
	U-Clip / BP350	314-0019-15		6	
	U-Clip / BP130	314-0026-15			4
	 Low U-Clip/ BP44	314-0023-15	2		
	Shrink on U-Clips	314-0021-01	6	6	6
	 L-Clip/BP130	314-0025-15			4
	 Iceblade	263-0005-15	4	8	8
	 Slotted clip support	314-0007-15	8	12	12
	Bolt - AN4-14A	261-0001-17		12	12
	Bolt - AN4-15A	261-0002-17	4		
	Bolt - AN4-16A	261-0003-17	4		
	Nuts - MS20365-428				
	equiv: AN365-428A or MS21044N4	262-0001-17	20	28	28
	Washers - AN960-416	263-0001-17	40	40	40
	Filler block 1/4"	314-0012-01	4	12	
	 Filler block 3/32"	314-0014-01	4		
	Filler block 1/8"	314-0015-01	4		12
DOCUMENTS	Plastic bag 9 x12	na	1	1	1
	Document - MDL/BP44	HTC-MDL-BP-R44-1000	1		
	Document - INST/BP44	314-0011-00	1		
	Document - MDL/BP350	HTC-MDL-BP-AS350-1000		1	
	Document - INST/BP350	314-0018-01-S		1	
	Document - MDL/BP130	HTC-MDL-BP-EC130-1000			1
	Document - INST/BP130	314-0031-00			1
	Can STC	na	1	1	1
	US STC	na	1	1	1
PACKAGING	Box / BP44 16.5x13x3.5"	na	1		
	Box / BP350 & BP130 24x21x3"	na		1	1
	Label /BP44	273-0001-04	1		
	Label /BP350 & BP130	273-0002-04		1	1

Nature of modifications: New format, added BP130

D. Baitan
2011 05 27

INSR
+ PACK

FIT® Preferred Heat Shrink Products

GENERAL PURPOSE, IRRADIATED POLYOLEFIN

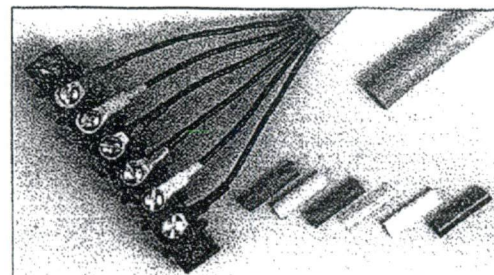
FIT-221 FOR BEARLAWS

MIL-DTL-23053/5C,
CLASS 1, 2
UL STANDARD 224
CSA STANDARD 198

CHOOSE **FIT-221** FOR:

- General Purpose Protection and Repair
- Identification and Beautifying Substrates
- Insulation from Environment
- Reduced Longitudinal Shrinkage
- Resistance to Water, Fungus, UV Light (black only)
- Use with **XTRA-GUARD® 1**

2 TO 1 SHRINK RATIO



FIT-221 APPLICATIONS:

- General Purpose Insulation and Repair
- Wire and Cable Harnessing and Bundling
- Cable and Connector Protection
- Wire and Tubing Splicing and Connecting
- **XTRA-GUARD® 1** Applications
- Automated Cutting Machines (spools)

CHARACTERISTICS

OPERATING TEMPERATURE:

- -55°C to 135°C

SHRINKAGE RATIO:

- Approximately 2 to 1 at 121°C

COLOR DESCRIPTION:

- 4-Foot Lengths:
3/64 to 2 Inch — Black, White, Clear, Red, Yellow, Blue, Green
3 and 4 Inch — Black, Clear
- 6-Inch Lengths:
3/64 to 1 Inch — Black, White, Clear, Red, Yellow, Blue, Green
1-1/2 to 3 Inch — Black, Clear
- 1/2 or 1 Inch Cut Pieces: Black
- Spools: See Color Availability Chart Next Page

PHYSICAL PROPERTIES:

- Tensile Strength: 1500 psi, (106 kg/cm²)
- Ultimate Elongation: 200%
- Longitudinal Shrinkage: -5%
- Specific Gravity: 1.35
- Secant Modulus: 2.5 x 10⁴ max.
- Flammability: Self-Extinguishing

CHEMICAL PROPERTIES:

- Corrosive Effect: Passes Copper Stability Test
- Fungus Resistance: No Growth

ELECTRICAL PROPERTIES:

- Dielectric Strength: 500V/mil (197 kV/cm)
- Volume Resistivity: 10¹⁴ ohm-cm

SPECIFICATIONS

- MIL-DTL-23053/5C, Class 1, 2
- UL Standard 224 (except for Clear)
- CSA Standard 198 (except for Clear)

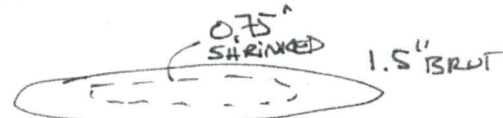
Recognized Component
Underwriters Laboratories Inc.

Certified
Canadian Standards Association

Packaged Assortments		
Assorted Sizes of 6" Lengths		
Each Length - Size Identified		
Assorted Colors		
Alpha Part No.	Tubing Size Range	Lengths Per Box
FIT-221-MS-1	3/64" - 3/16" (5 Sizes)	6 per Size (30 Lengths)
FIT-221-MS-2	1/4" - 3/4" (4 Sizes)	4 per Size (16 Lengths)

WE PURCHASE

1.5" wide



Recommended For Use With
XTRA-GUARD® 1
Extra-Premium Grade PVC Jacketed
General Purpose Cables



Toll Free: 1-800-52 ALPHA • Telephone: 908-925-8000 • Fax: 908-925-6923
Europe/UK Telephone: +44 (0) 1932 772422 • Europe/UK Fax: +44 (0) 1932 772433

Web Site: www.alphawire.com
Email: info@alphawire.com

MIL-DTL-23053/5C,
CLASS 1, 2
UL STANDARD 224
CSA STANDARD 198
RoHS COMPLIANT

FIT® Preferred Heat Shrink Products

GENERAL PURPOSE, IRRADIATED POLYOLEFIN

FIT®-221

Alpha Part No. And Size	Minimum Supplied I.D.		Maximum Recovered I.D.		Nom. Recovered Wall Thickness		4 Ft. Lengths Total Ftg.	Standard Packages				No. Cut Pieces 6 Inch	No. Cut Pieces 1/2" or 1"
	Inches	mm	Inches	mm	Inches	mm		Tot. Ftg.	Tot. Ftg.	Tot. Ftg.	Tot. Ftg.		
FIT-221-3/64	0.046	1,17	0.023	0,58	0.016	0,41	100	1000				40	1000
FIT-221-1/16	0.063	1,60	0.031	0,78	0.017	0,43	100	1000	100	70		36	1000
FIT-221-3/32	0.093	2,36	0.046	1,17	0.020	0,50	100	500	100	65		32	1000
FIT-221-1/8	0.125	3,18	0.062	1,58	0.020	0,50	100	500	100	60		28	1000
FIT-221-3/16	0.187	4,75	0.093	2,36	0.020	0,50	100	500	100	50		24	1000
FIT-221-1/4	0.250	6,35	0.125	3,18	0.025	0,63	100	250	100	40		20	1000
FIT-221-3/8	0.375	9,53	0.187	4,75	0.025	0,63	100	200	50	35		16	1000
FIT-221-1/2	0.500	12,70	0.250	6,35	0.025	0,63	20	150	50	32		14	-
FIT-221-3/4	0.750	19,10	0.375	9,53	0.030	0,76	20	250	50	24		12	-
FIT-221-1	1.000	25,40	0.500	12,70	0.035	0,88	20	250	50	16		8	-
FIT-221-1-1/2	1.500	38,10	0.750	19,10	0.040	1,02	20	125	-	-		5	-
FIT-221-2	2.000	50,80	1.000	25,40	0.045	1,16	20	125	-	-		3	-
FIT-221-3	3.000	76,20	1.500	38,10	0.050	1,27	8	100	-	-		2	-
FIT-221-4	4.000	101,60	2.000	50,80	0.055	1,40	8	50	-	-		1	-

115

SPOOL COLOR AVAILABILITY CHART

FIT-221 Tubing Size	Put-Up	Colors
3/64"	1000'	Black, Clear
1/16"	1000'	All Colors*
	100'	Black, Clear
	70'	All Colors
3/32"	500'	All Colors
	100'	Black, Clear
	65'	All Colors
1/8"	500'	All Colors
	100'	Black, Clear
	60'	All Colors
3/16"	500'	All Colors
	100'	Black, Clear
	50'	All Colors
1/4"	250'	All Colors
	100'	Black, Clear
	40'	All Colors

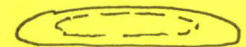
FIT-221 Tubing Size	Put-Up	Colors
3/8"	200'	All Colors
	50'	Black, Clear
	35'	All Colors
1/2"	150'	All Colors
	50'	Black, Clear
	32'	All Colors
3/4"	250'	All Colors
	50'	Black, Clear
	24"	All Colors
1"	250"	All Colors
	50"	Black, Clear
	16"	All Colors
1-1/2"	125'	Black, Clear
2"	125'	Black, Clear
3"	100'	Black, Clear
4"	50'	Black, Clear

*All colors include black, white, clear, red, yellow, blue, green

Achat chez:
Pro-technique
ou
Crosbel

SHRINKS 50%

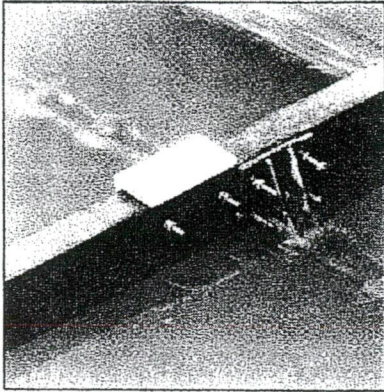
SO WE NEED 1.5"
TO GET 0.75" SHRINKED



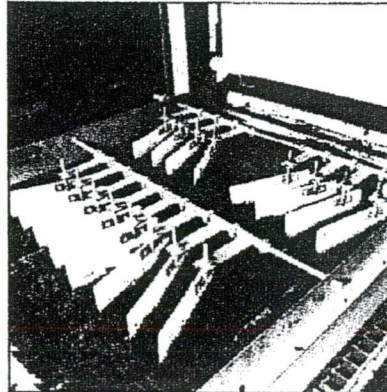
**SEE PAGE 116
FOR
ECONOMICAL BULK PACKAGES!**

BP 350
cut
6.75" LONG
EACH

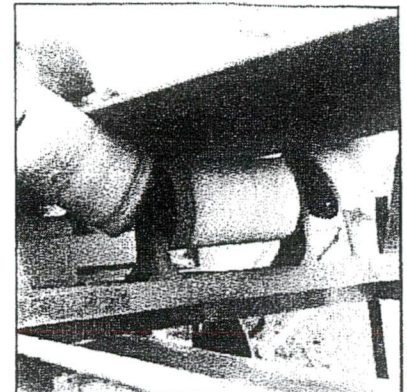
Propriétés du UHMW TIVAR®



TIVAR flight wear shoes do not corrode, and outwear shoes made from metals, urethanes and other plastics.



TIVAR is used in many OEM applications to solve abrasion and corrosion problems. The scrapers on this belt press are of TIVAR.



Conveyor rollers lined with TIVAR reduce belt wear. Wet sludge doesn't build up as on conventional rollers.

PROPERTY		TEST METHOD		UNIT	TYPICAL VALUE
Specific Gravity		ASTM D-792		g/cm ³	0.94
Yield Strength	@ 73°F	ASTM D-638		p.s.i.	3400
Ultimate Tensile Strength	@ 73°F	ASTM D-638		p.s.i.	6800
Break Elongation	@ 73°F	ASTM D-638		%	450
Yield Strength	@ 250°F	Stress Strain Diagram		p.s.i.	700
Ultimate Tensile Strength	@ 250°F	Stress Strain Diagram		p.s.i.	3300
Break Elongation	@ 250°F	Stress Strain Diagram		%	900
Hardness — Rockwell "R" Scale		ASTM D-785		—	64
Shore "D" Scale		ASTM D-2240		—	67
Flexural Modulus of elasticity		Bend Creep/1 min. value		p.s.i.	110,000
Shear Strength		ASTM D-732		p.s.i.	3500
Izod Impact + @ 23°C		ASTM D-256A		ft-lbs/in. notch	No Break
- @ 140°C		ASTM D-256A		ft-lbs/in. notch	No Break
Environmental Stress Cracking @ F ₅₀		ASTM D-1693 Mod		hrs.	6000
Water Absorption		ASTM D-570		—	NIL

COEFFICIENT OF FRICTION

UHMW Polymer has a lower coefficient of friction than glass. Together with its self-lubricating characteristics it is an ideal material for bearings, bushings, valves, wear strips or any application where sliding contact is encountered.

MATERIALS	STATIC	KINETIC	TEST METHOD
Mild Steel vs. Mild Steel	0.30-0.40	0.25-0.35	ASTM D-1894
Mild Steel vs. TIVAR-100	0.15-0.20	0.12-0.20	
TIVAR-100 vs. TIVAR-100	0.20-0.30	0.20-0.30	

DEFORMATION UNDER COMPRESSION - %							PERMANENT DEFORMATION AFTER REMOVAL OF LOAD	
TEMP °F	PSI COMPRESSION	INITIAL LOADING					AFTER 1 MIN.	AFTER 24 HRS.
		10 MIN.	100 MIN.	1000 MIN.	1 DAY	56 DAYS		
68°	282	1.5	1.7	1.8	1.9	2.4	0.9	0.6
	570	2.4	2.5	2.7	3.0	4.0	1.8	1.2
	850	3.0	4.0	4.5	5.0	5.1	2.7	1.8
	1140	4.0	5.0	6.0	7.0	7.5	3.6	2.4
	1420	5.0	6.5	7.5	8.0	9.0	4.5	2.9
	1700	7.0	7.5	8.0	10.0	11.0	5.4	3.5

CHEMICAL RESISTANCE

Hydrochloric acid (conc.) - no appreciable reaction up to 80°C

Nitric acid (20%) - less than 20% decrease in yield stress and ultimate tensile strength up to 80°C.

Sulphuric acid (50%) - no appreciable reaction up to 80°C. Less than 20% decrease in properties at 75% concentration.

Sodium hydroxide (caustic soda) - no appreciable reaction up to 80°C.

Sodium hypochlorite and most aqueous solutions of inorganic salts - no appreciable reaction up to 80°C.

Hydrocarbons and halogenated hydrocarbons - limited resistance. Each application should be evaluated.

www.plastiquepolyfab.com

QUÉBEC : 1275, de la Jonquière, Québec, QC, Tél. : 418-682-0760 ou 1-866-682-0760

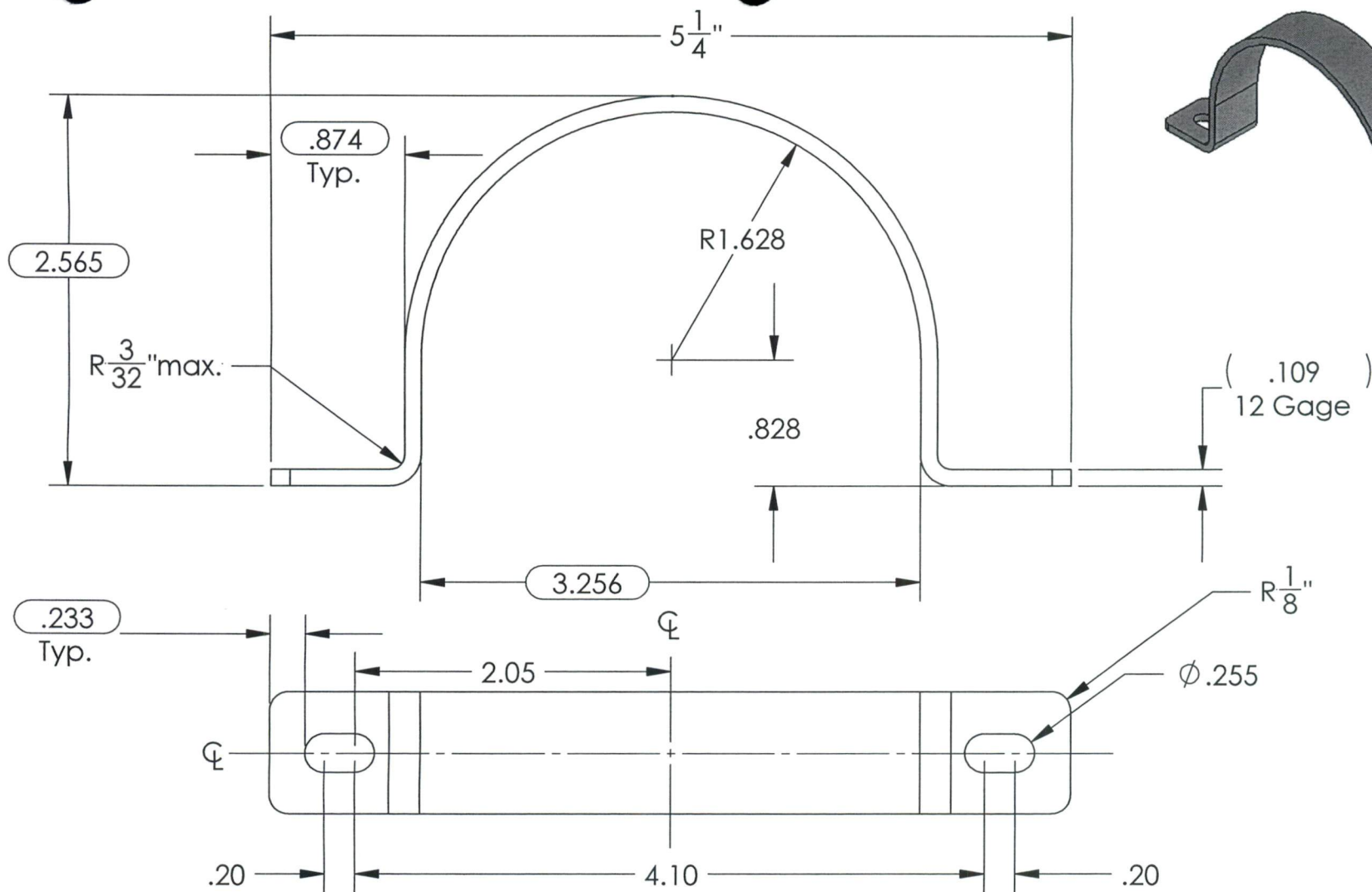
MONTREAL : 7600, Rte Transcanadienne, St-Laurent, QC, H4T 1A5 Tél. : 514-738-6817 ou 1-888-506-9600

D. Barber 06.08.01

Ultra High Molecular Weight Polyethylene

UHMWPE Typical Properties

Specific Gravity, 73°F	.944	
Tensile Strength @ Yield, 73°F	3250	psi
Tensile Modulus of Elasticity, 73°F	155,900	psi
Tensile Elongation (at break), 73°F	330	%
Flexural Modulus of Elasticity	107,900	psi
Compressive Strength at 2% deformation	400	psi
Compressive Strength 10% Deformation	1200	psi
Deformation Under Load	6-8	%
Compressive Modulus of Elasticity, 73°F	69,650	psi
Hardness, Durometer (Shore "D" scale)	69	
Izod Impact, Notched @ 73°F	30	ft.lbs./in. of notch
Coefficient of Friction (Dry vs Steel) Static	.17	
Coefficient of Friction (Dry vs Steel) Dynamic	.14	
Sand Wheel Wear/Abrasion Test	95	UHMW=100
Coefficient of Linear Thermal Expansion	11.0	in/in/°F x 10 ⁻⁵
Melting Point (Crystalline Peak)	279-289	°F
Volume Resistivity	>10 ¹⁵	ohm-cm
Surface Resistivity	>10 ¹⁵	ohm-cm
Water Absorption, Immersion 24 Hours	Nil	%
Water Absorption, Immersion Saturation	Nil	%
Machinability Rating	5	1 = easy, 10 = difficult
Sheet Thickness Availability (Off the Shelf)	.250 - 2.0	inches



Vanair inc.
 860, Marie-Victorin
 St-Nicolas, Lévis (Québec)
 Canada, G7A 3S9
 Tél. (418) 561-4512
 Fax (418) 836-2291
 www.helitowcart.com

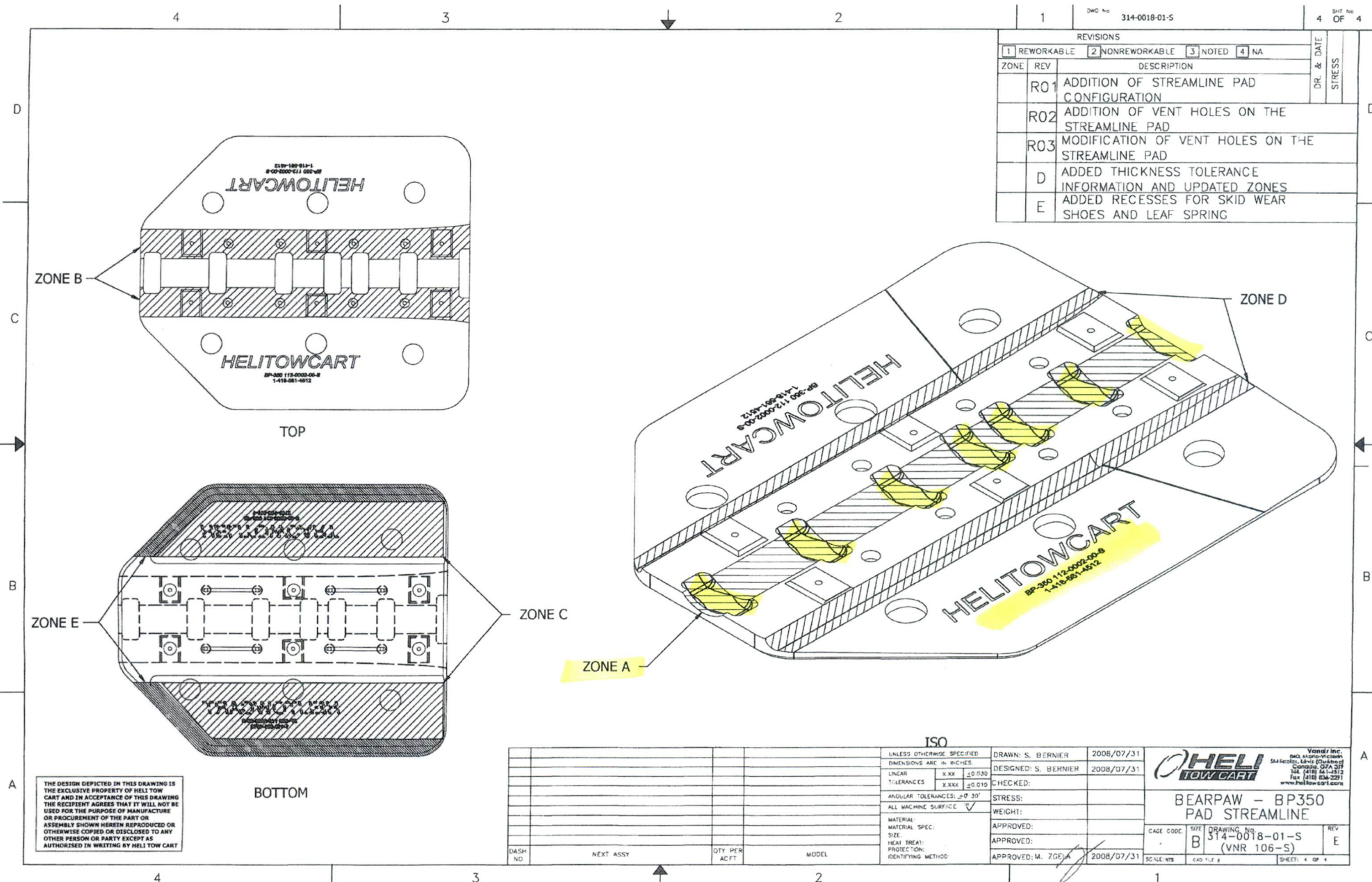
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TOLERANCES		Titre / Title:		Matériel / Material:	
		Bearpaw BP-350 - U shaped clip		SST 304 12ga	
X/X	$\pm 1/32"$	Dessiné par / Drawing by:	Date: (mm/dd/yyyy)	Format:	Echelle / Scale:
X.X	$\pm 1/64"$	G.Lapointe	10/03/06	A	1:1
X.XX	$\pm 0.010"$	Vérifié par / Checker by:	Date: (mm/dd/yyyy)	Dessin # / Drawing #:	# Page:
X.XXX	$\pm 0.005"$			VNR107	1
Finish		Approuvé par / Approved by:	Date: (mm/dd/yyyy)	Pièce # / Part #:	Rev #:
ANGLES $\pm 1^\circ$		J. Lapointe	2008.03.13	314-0019-15-A	R01

R01	Initial Issue	10/03/06	G.L.
Rev.	Description	Date	By

314-0019-15-A

REVISIONS						DR. & DATE	STRESS	
1	REWORKABLE	2	NONREWORKABLE	3	NOTED			4
ZONE	REV	DESCRIPTION						
	R01	ADDITION OF STREAMLINE PAD CONFIGURATION						
	R02	ADDITION OF VENT HOLES ON THE STREAMLINE PAD						
	R03	MODIFICATION OF VENT HOLES ON THE STREAMLINE PAD						
	D	ADDED THICKNESS TOLERANCE INFORMATION AND UPDATED ZONES						
	E	ADDED RECESSES FOR SKID WEAR SHOES AND LEAF SPRING						



4

3

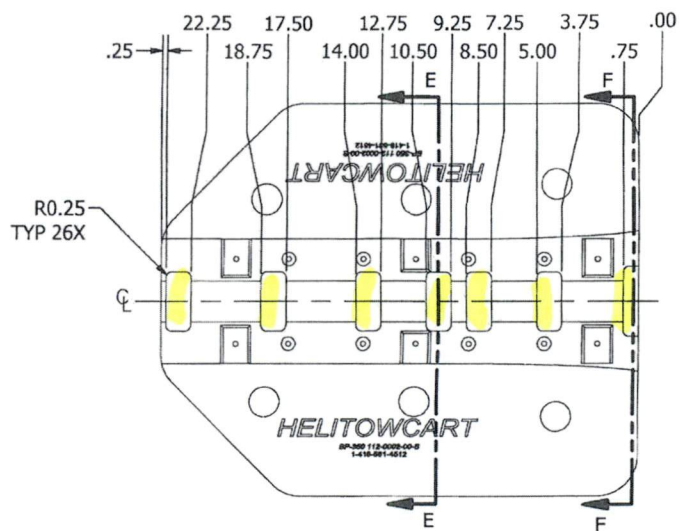
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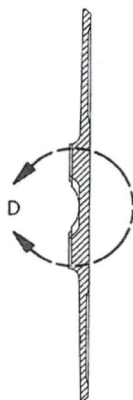
DWG No 314-0018-01-S

SHEET No
3 OF 4

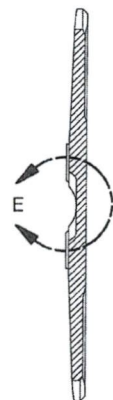
REVISIONS			
1	2	3	4
REWORKABLE	NONREWORKABLE	NOTED	NA
ZONE	REV	DESCRIPTION	
	R01	ADDITION OF STREAMLINE PAD CONFIGURATION	
	R02	ADDITION OF VENT HOLES ON THE STREAMLINE PAD	
	R03	MODIFICATION OF VENT HOLES ON THE STREAMLINE PAD	
	D	ADDED THICKNESS TOLERANCE INFORMATION AND UPDATED ZONES	
	E	ADDED RECESSES FOR SKID WEAR SHOES AND LEAF SPRING	



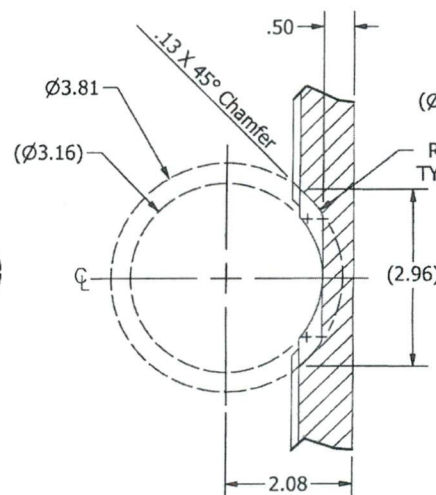
WEAR PAD BOLT CLEARANCES
SCALE 1/6



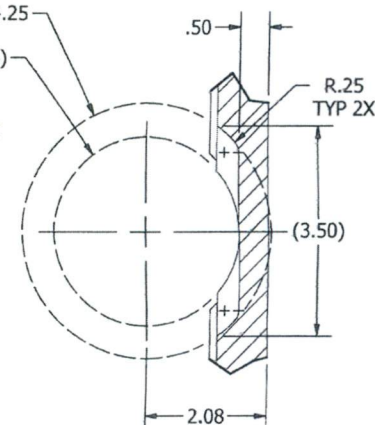
SECTION E-E
SCALE 1/6



SECTION F-F
SCALE 1/6



DETAIL D
SCALE 1/2
TYP 6X



DETAIL E
SCALE 1/2

UNLESS OTHERWISE SPECIFIED:				DRAWN: S. BERNIER 2008/07/31	
DIMENSIONS ARE IN INCHES				DESIGNED: S. BERNIER 2008/07/31	
LINEAR TOLERANCES				CHECKED:	
ANGULAR TOLERANCES: ± 30°				STRESS:	
ALL MACHINE SURFACE				WEIGHT:	
MATERIAL SPEC:				APPROVED:	
SIZE:				APPROVED:	
HEAT TREAT:				APPROVED: M. ZGELA 2008/07/31	
IDENTIFYING METHOD:				SCALE:	
DASH NO	NEXT ASSY	QTY PER ACFT	MODEL	CASE CODE: B	
				DRAWING No: 314-0018-01-S	
				SHEET: 3 OF 4	

4

3

2

1

4

3

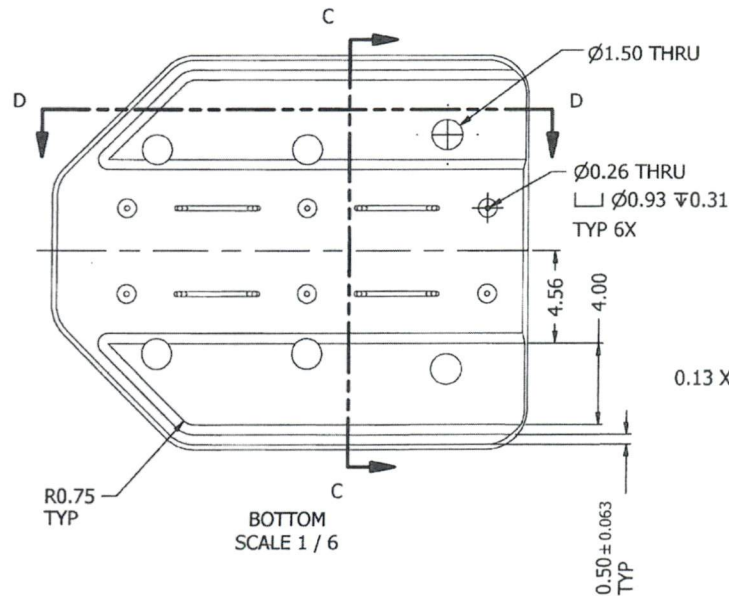
2

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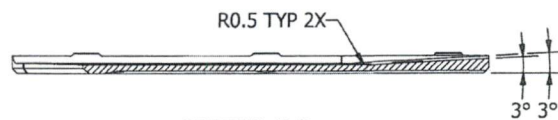
DWG No 314-0018-01-S

2 OF 4

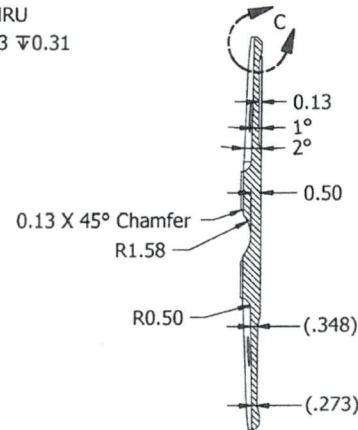
REVISIONS			
1	REWORKABLE	2	NONREWORKABLE
3	NOTED	4	NA
ZONE	REV	DESCRIPTION	
	R01	ADDITION OF STREAMLINE PAD CONFIGURATION	
	R02	ADDITION OF VENT HOLES ON THE STREAMLINE PAD	
	R03	MODIFICATION OF VENT HOLES ON THE STREAMLINE PAD	
	D	ADDED THICKNESS TOLERANCE INFORMATION AND UPDATED ZONES	
	E	ADDED RECESSES FOR SKID WEAR SHOES AND LEAF SPRING	



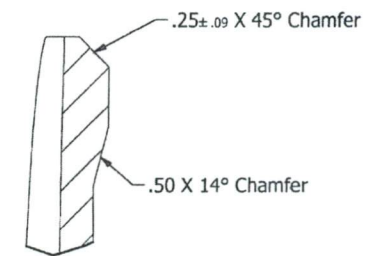
BOTTOM
SCALE 1 / 6



SECTION D-D
SCALE 1 / 6




SECTION C-C
SCALE 1 / 6



DETAIL C
SCALE 1 : 1

THE DESIGN DEPICTED IN THIS DRAWING IS THE EXCLUSIVE PROPERTY OF HELI TOW CART AND IN ACCEPTANCE OF THIS DRAWING THE RECIPIENT AGREES THAT IT WILL NOT BE USED FOR THE PURPOSE OF MANUFACTURE OR PROCUREMENT OF THE PART OR ASSEMBLY SHOWN HEREIN REPRODUCED OR OTHERWISE COPIED OR DISCLOSED TO ANY OTHER PERSON OR PARTY EXCEPT AS AUTHORIZED IN WRITING BY HELI TOW CART

				UNLESS OTHERWISE SPECIFIED		DRAWN: S. BERNIER		2008/07/31		 <div>Vander Inc. P.O. Box 100 354 Acety Lane, Cleveland TN 37317 Tel: (615) 481-2517 Fax: (615) 481-2518 www.helion-cs.com</div>	
				DIMENSIONS ARE IN INCHES		DESIGNED: S. BERNIER		2008/07/31			
				LINE-IT: X.XX ±0.030		CHECKED:					
				TOLERANCES: X.XXX ±0.010		STRESS:					
				ANGULAR TOLERANCES: ±0° 30'		WEIGHT:					
				ALL MACHINE SURFACE		APPROVED:					
				MATERIAL:		APPROVED:				<div>BEARPAW – BP350 PAD STREAMLINE</div> <div>DWG CODE: SIZE B DRAWING: 314-B-0818-01-S REV: E (VNR 106-S)</div> <div>SCALE: NTS CAD FILE: E SHEET: 3 OF 4</div>	
				MATERIAL SPEC:		APPROVED:					
				SIZE:		APPROVED: M. ZGELA		2008/07/31			
				HEAT TREAT:							
				PROTECTION:							
				IDENTIFYING METHOD:							
DASH NO	NEXT ASSY	QTY PER ACFT	MODEL	APPROVED: M. ZGELA		2008/07/31					

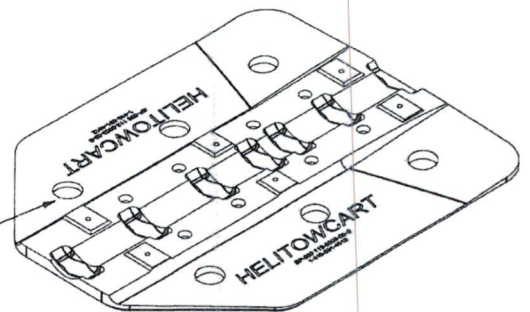
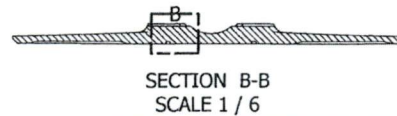
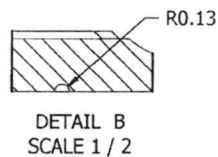
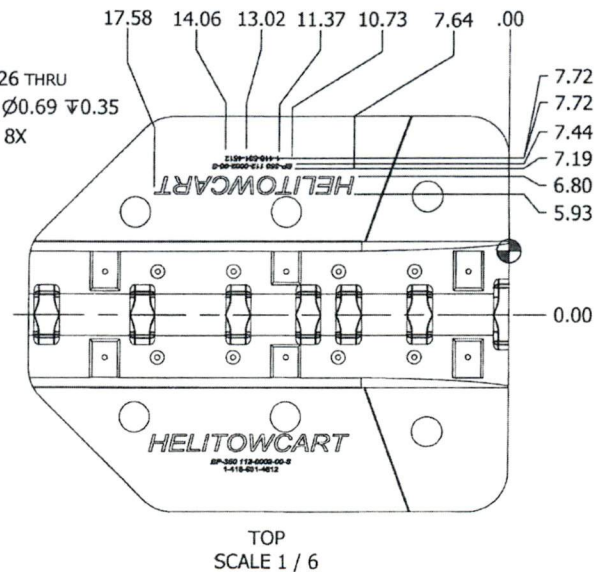
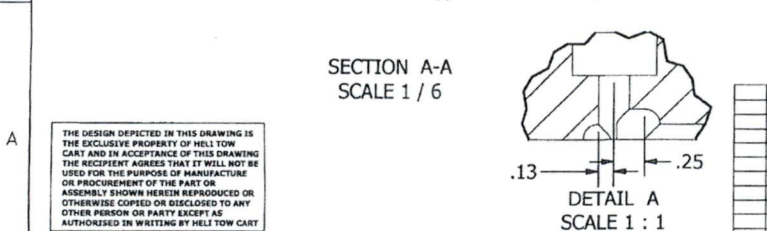
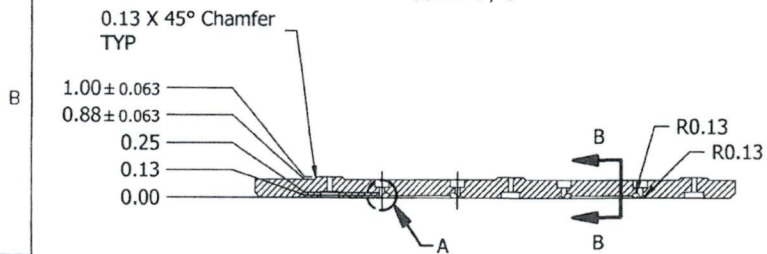
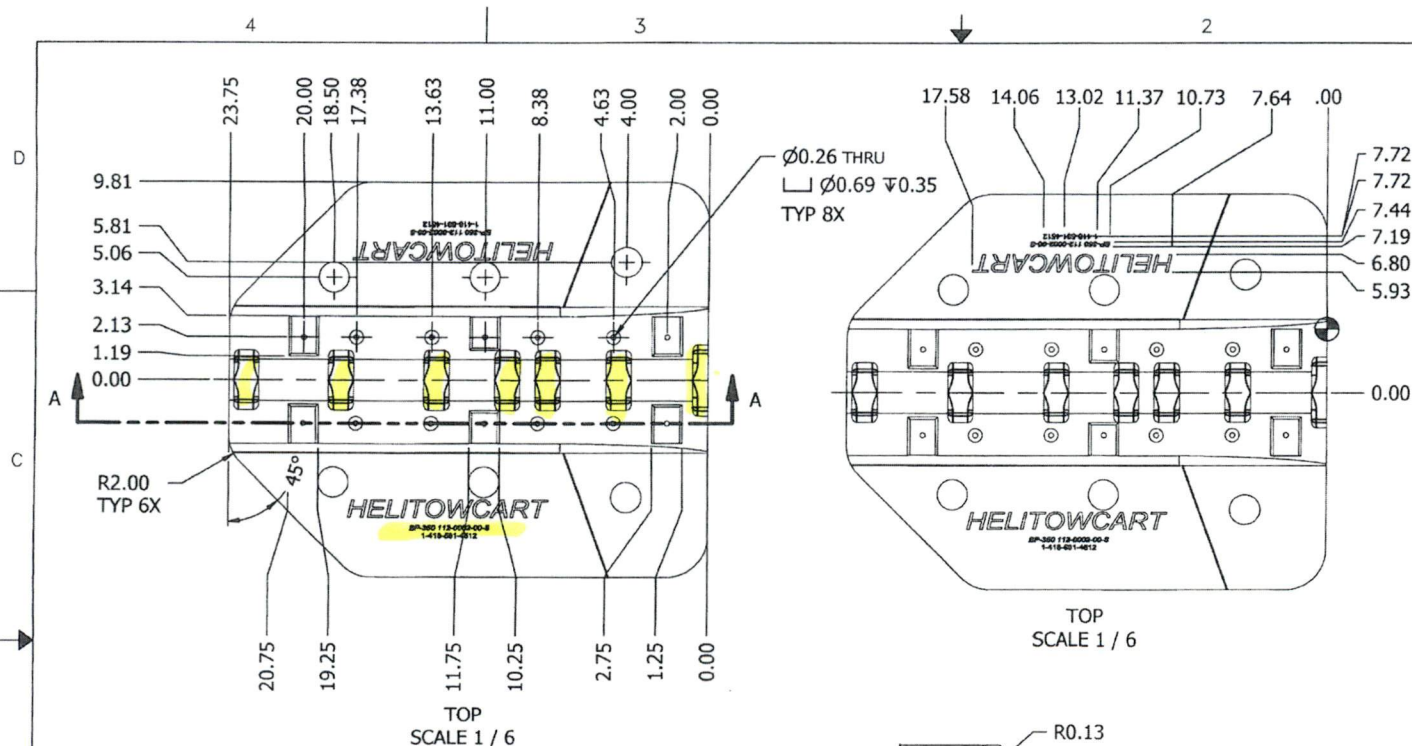
BEARPAW - BP350 PAD STREAMLINE			
SIZE CODE	SIZE	DRAWING NO	REV
B	B	314-0018-01-S (VNR 106-S)	E
SCALE: NTS	DATE: 11/1/08	SHEET: 2 OF 4	

4

3

2

1



REVISIONS				DATE	STRESS
1	2	3	4		
ZONE	REV	DESCRIPTION			
	R01	ADDITION OF STREAMLINE PAD CONFIGURATION			
	R02	ADDITION OF VENT HOLES ON THE STREAMLINE PAD			
	R03	MODIFICATION OF VENT HOLES ON THE STREAMLINE PAD			
	D	ADDED THICKNESS TOLERANCE INFORMATION AND UPDATED ZONES			
	E	ADDED RECESSES FOR SKID WEAR SHOES AND LEAF SPRING			

1	1	314-0018-01-S	PAD STREAM LINE	POLYETHYLENE UHMW	BLACK	1.00
ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL	SPECIFICATION	SIZE
			UNLESS OTHERWISE SPECIFIED	DRAWN: S. BERNIER	2008/07/31	
			DIMENSIONS ARE IN INCHES	DESIGNED: S. BERNIER	2008/07/31	
			LINEAR	X.XX	±0.030	
			TOLERANCES	X.XXX	±0.010	
			ANGULAR TOLERANCES	±0.30°		
			ALL MACHINE SURFACE	✓		
			MATERIAL SPEC.			
			SIZE:			
			HEAT TREAT:			
			PROTECTION:			
			IDENTIFYING METHOD:			
			APPROVED: M. ZGELA	2008/07/31		

DATE	DRAWING NO.	REV
2008/07/31	314-0018-01-S	E
	(VNR 106-S)	

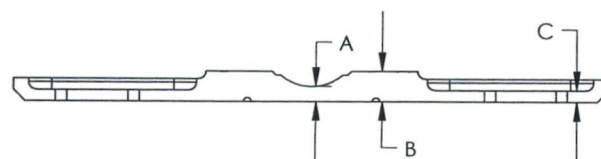
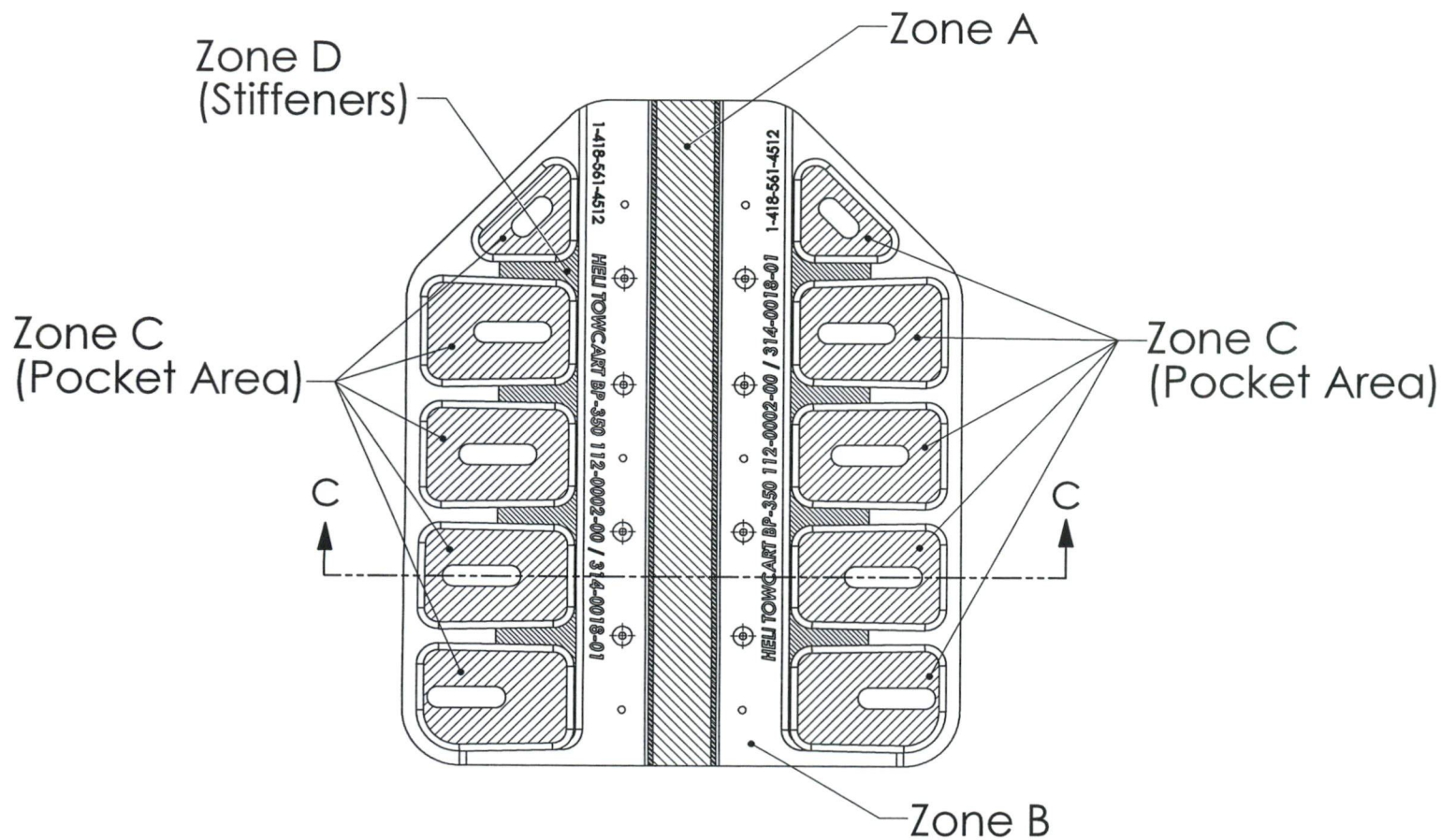
W. Barber 2016 06 22

314-0018-01-S rev E

Tip: Aviser Fourt.
au moment du PO
de se cotter/ANDER
du "1"-fort", ie.

1" TOLERANCE +

Pour faciliter
son ~~rectification~~
NB



COUPE C-C

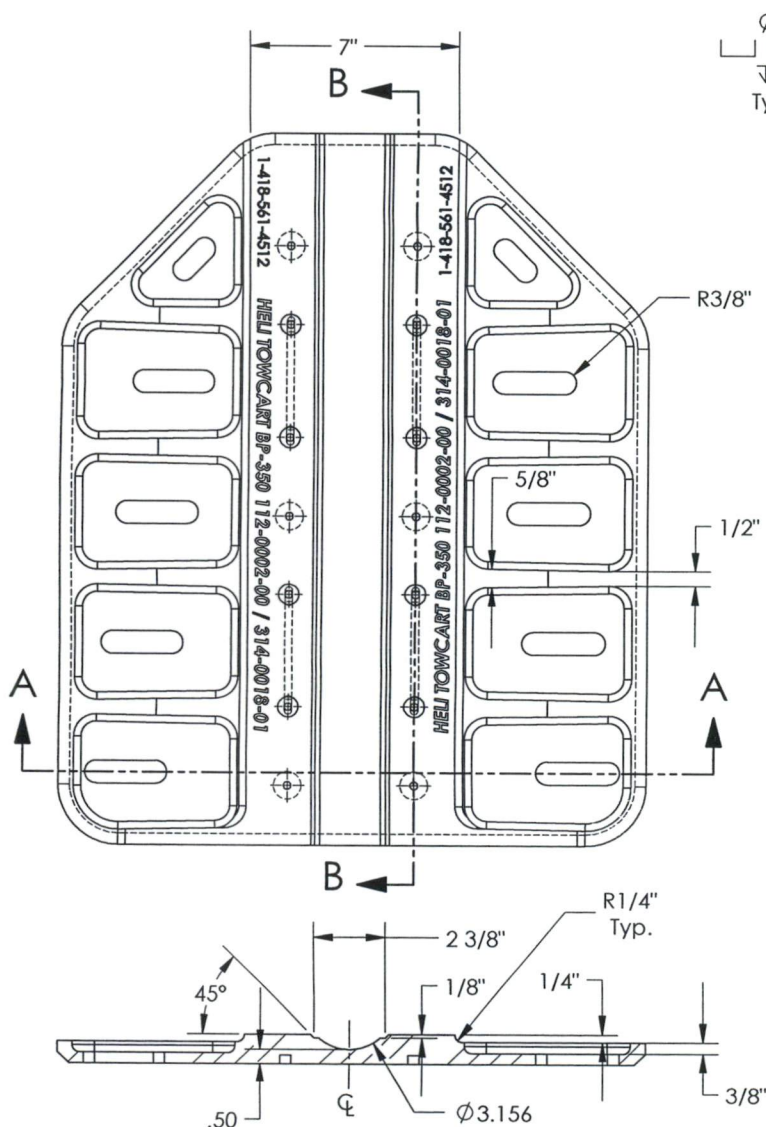


Vanair Inc.
860, Marie-Victorin
St-Nicolas, Lévis (Québec)
Canada, G7A 3S9
Tél: (418) 561-4512
Fax: (418) 836-2291
www.helitowcart.com

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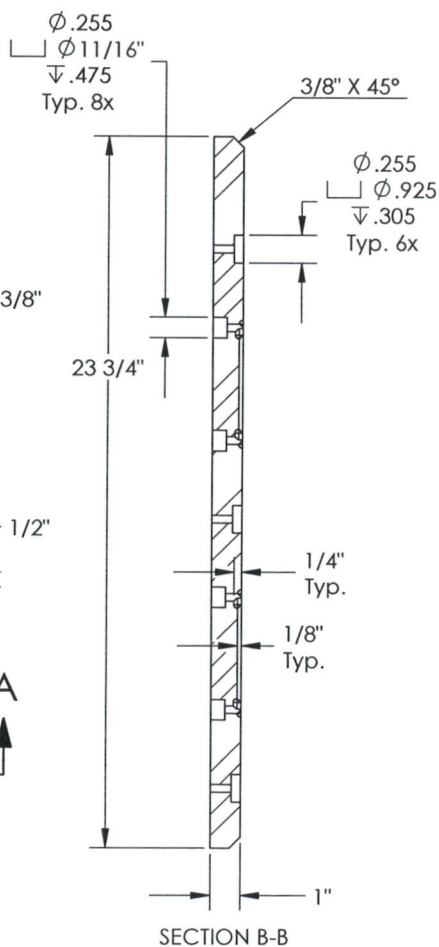
TOLERANCES		Title / Titre:		Matériau / Material:	
X/X	± 1/32"	Bearpaw BP-350 - Pad		UHMW Black	
XX	± 1/64"	Dessiné par / Drawing by:	Date: (mm/dd/yyyy)	Format:	Echelle / Scale:
X.XX	± 0.010"	G.Lapointe	11/20/06	B	1:4
X.XXX	± 0.005"	Vérifié par / Checker by:	Date: (mm/dd/yyyy)	Dessin # / Drawing #:	# Page:
				VNR106	2 / 2
		Approuvé par / Approved by:	Date: (mm/dd/yyyy)	Pièce # / Part #:	Rev #:
				314-0018-01	R02
					Rev #:
					B

314-0018-01-15



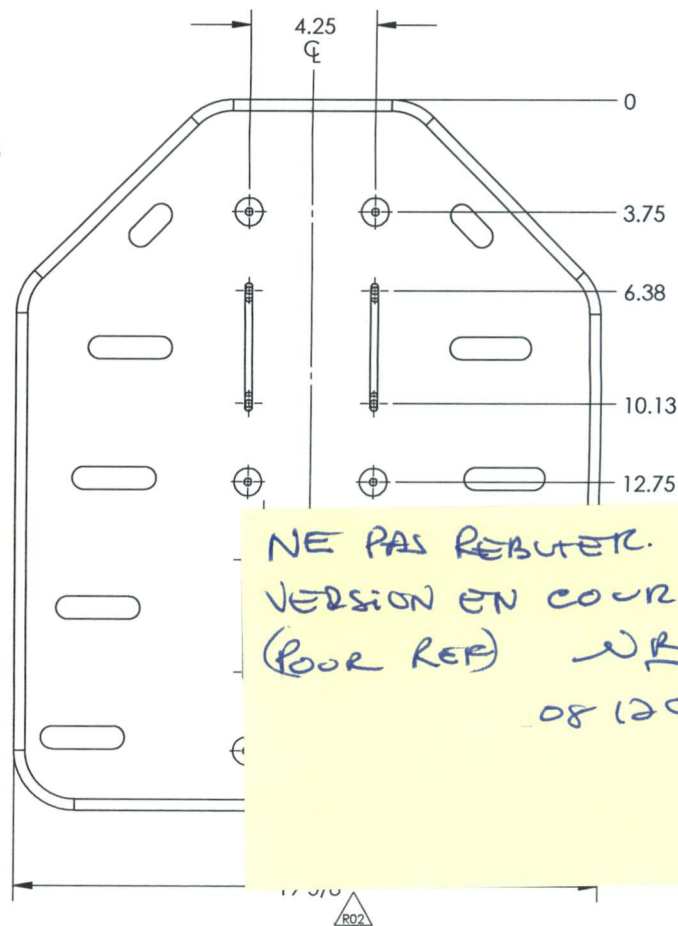
Rev.	Description	Date	Par
R02	Smaller - was 20"	11/20/06	G.L.
R01	Initial issue	09/18/06	G.L.

SECTION A-A



SECTION B-B

- Note :**
- Raw material specification : UHMW Polyethylene Sheet 1"
 - Machined From File : VNR106.SLDPR1
 - Break corner 0.01 x 45 deg Typ.
 - If no indicated dimension, Follow 3D file Specs.



NE PAS REBUTER.
VERSION EN COURS
(POUR REP) WB
08/2006

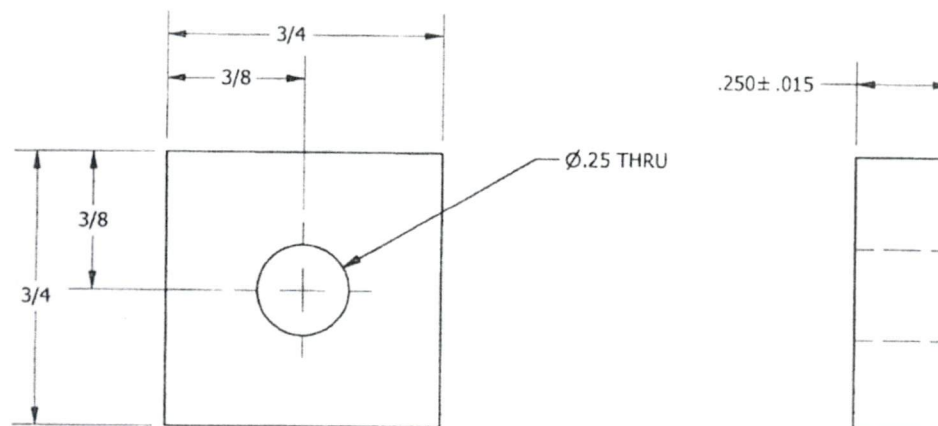
HELI TOW CART		Vanair Inc. 860, Marie-Victorin St-Nicolas, Lévis (Québec) Canada, G7A 3S9 Tél. (418) 561-4512 Fax (418) 836-2291 www.helitowcart.com		THIS DOCUMENT IS PROPERTY OF VANAIR INC. WRITTEN PERMISSION FROM VANAIR INC. SHALL BE OBTAINED PRIOR TO COPYING, USING OR MODIFYING.	
TOLERANCES		Titre / Title: Bearpaw BP-350 - Pad		Matériau / Material: UHMW Black	
X/X	± 1/32"	Dessiné par / Drawing by:	Date: (mm/dd/yyyy)	Format:	Echelle / Scale:
X.X	± 1/64"	G.Lapointe	11/20/06	B	1:4
X.XX	± 0.010"	Vérifié par / Checker by:	Date: (mm/dd/yyyy)	Dessin # / Drawing #:	# Page:
X.XXX	± 0.005"			VNR106	1 / 2
ANGLES ± 1°		Approuvé par / Approved by:	Date: (mm/dd/yyyy)	Place # / Part #:	Rev #:
Fresh		J. B. B.	11-26-2006	314-0018-01	R02
					B

314-0018-01-B

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.5M 1994,
DIMENSIONS AND TOLERANCING.

ITEM	QTY	PART	1BER	DESCRIPTION	MATERIAL	SPECIFICATION	SIZE
1	1	314-0012-01		BEARPAW - FILLER BLOCK 1/4	UHMW	---	1/4" THK.



FRONT
SCALE 2 : 1

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DRAFTED BY: G. LAPOINTE DATE: 2006-09-06

CHECKED BY: M. ZGELA DATE: 2006-08-08

APPROVED TCCA BY: M. ZGELA DATE: 2006-08-08

IF NOT SPECIFIED
GENERAL TOLERANCE

1/X ± 1/32
X.XX ± 0.010"
X.XXX ± 0.005"
ANG. ± 1°

UNITS:
INCH

SIZE
A

SCALE:
N/A

Helitowcart (Vanair inc.)
St-Nicolas, Levis, Qc, Canada
www.helitowcart.com

DEFINITION:
BEARPAW
FILLER BLOCK 1/4"

DRAWING NUMBER:

314-0012-01

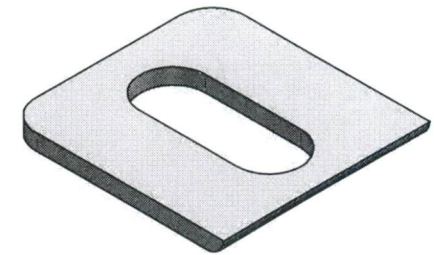
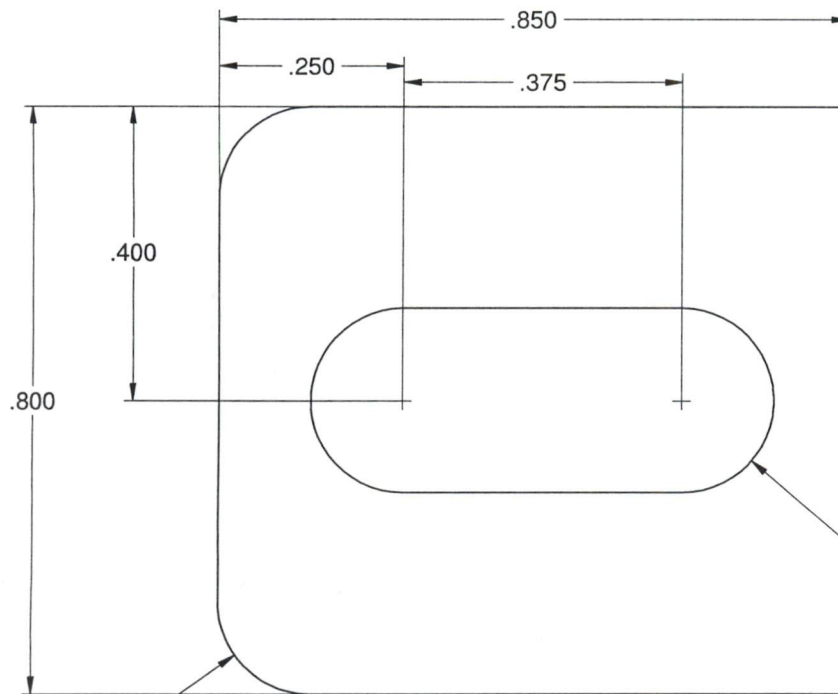
REV
B

SHEET:
1 OF 1

REVISION				
REV	DESCRIPTION	REVISED BY	APPROVED	DATE
A	INITIAL ISSUE	G.LAPOINTE	M. ZGELA	2006-08-08
B	HOLE 0.25", REMOVED REV. LETTER FROM P/N	R.B.R.	M. ZGELA	2013-08-09

314-0012-01 Rev B

[Signature] 2013 A 11



R 1/8 in
Typ.

1/16 in
(gege 16)

R 1/16 in
Round edge
Sanding

Ø .250 $+0.015$
 -0.000

Note :
Raw material specification :
Stainless steel 304 annealed
Sheet gage 16

Rev.	Description	Date	By
R04	0.800 was 0.750 - 0.850 was 0.875	31-07-06	G.L.
R03	Issue for production	04-04-06	G.L.

TOLERANCES
1/X \pm 1/32"
X.XX \pm 0.010"
X.XXX \pm
ANGLE \pm 1°
PROJECTION:

		Vanair inc. 860, Marie-Victorin St-Nicolas, Lévis (Québec) Canada, G7A 3S9 Tél. : (418) 561-4512 Fax : (418) 836-2291 www.helitowcart.com		THIS DOCUMENT IS PROPERTY OF VANAIR INC. WRITTEN PERMISSION FROM VANAIR INC. SHALL BE OBTAINED PRIOR TO COPYING, USING OR MODIFYING.	
		Titre / Title: Bearpaw - Slotted clip support Matériel / Material: SEE NOTE			
Dessiné par / Drawing by:	Date: (yyyy-mm-dd)	Format :	Échelle / Scale:	Page #:	
G. Lapointe	2006-04-24	A	4 : 1	1 de 1	
Vérifié par / Checked by:	Date: (yyyy-mm-dd)	Numéro dessin / Drawing Number:		Rev. #:	
		VNR089		R04	
Approuvé par / Approved by:	Date: (yyyy-mm-dd)	Numéro de pièce / Part Number:		Rev. #:	
	06.08.01	314-0007-15-B			

314-0007-15-B

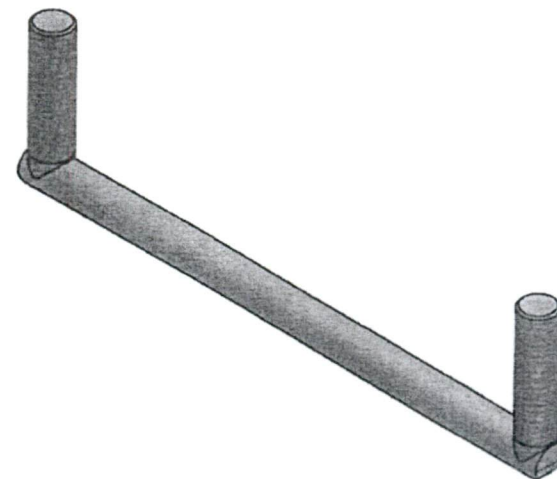
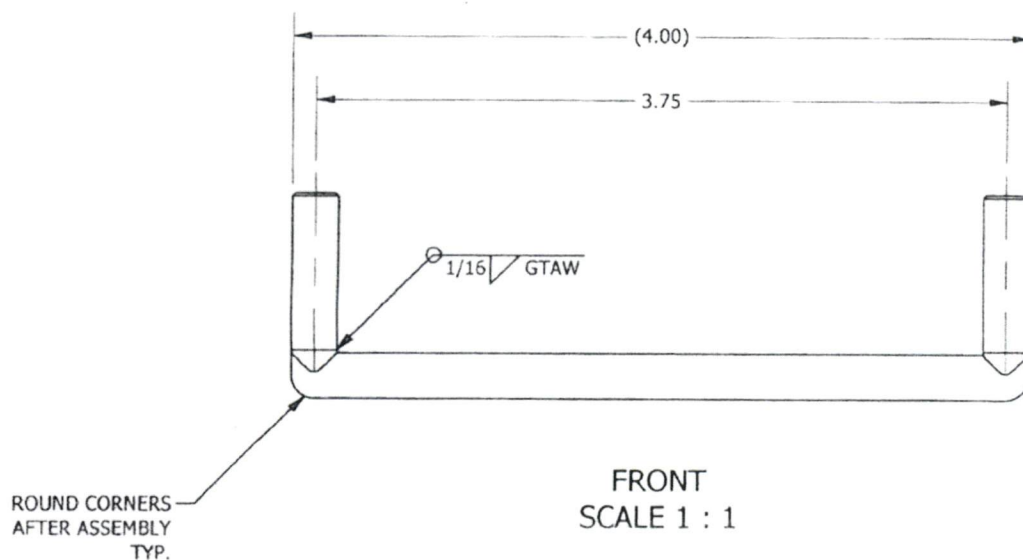
NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.5M 1994, DIMENSIONS AND TOLERANCING.

2. REMOVE ALL BURRS AND SHARP EDGES 1/64" MAX.

3. FILLER MATERIAL AWS A-5.9 / ASME SFA-5.9 MGSS308L

ITEM	QTY	PART NUM	DESCRIPTION	MATERIAL	SPECIFICATION	SIZE
1	1	314-0002	BEARPAW - ICE BLADE ASSEMBLY	SS304	ANNEALED	ROD 1/4" DIA.
2	2	314-0004-15	BEARPAW - ICEBLADE THREADED ROD	SS304	ANNEALED	1/4-28 UNF - 2A



NOTE AU FOURNISSEUR:
ÉBAVURER TOUT LE TOUR R1/64"
PASSER DANS L'ACIDE
REMPLIR FICHE D'INSPECTION CLIENT

THIS DRAWING IS PROPERTY OF HELITOWCART AND MAY NOT BE COPIED OR DISTRIBUTED WITHOUT AUTHORIZATION.		Helitowcart (Vanair inc.) St-Nicolas, Levis, Qc, Canada www.helitowcart.com	
DRAFTED BY: G. LAPOINTE	DATE: 2006-04-24	DEFINITION: BEARPAW ICEBLADE ASSEMBLY	
CHECKED BY:	DATE:	DRAWING NUMBER: 314-0005-15	
APPROVED TCCA BY: M. ZGELA	DATE: 2006-04-24	REVISION: B	
IF NOT SPECIFIED GENERAL TOLERANCE		UNITS: INCH	
1/X ± 1/32 X.XX ± 0.010" X.XXX ± 0.005" ANG. ± 1°		SIZE A	
		SCALE: N/A	
		SHEET: 1 OF 1	

REVISION				
REV	DESCRIPTION	REVISED BY	APPROVED	DATE
A	INITIAL ISSUE	G.LAPOINTE	M. ZGELA	2006-04-24
B	REMOVED REVISION LETTER FROM P/N	R.B.R.	M. ZGELA	2013-08-09

314-0005-15 rev. B

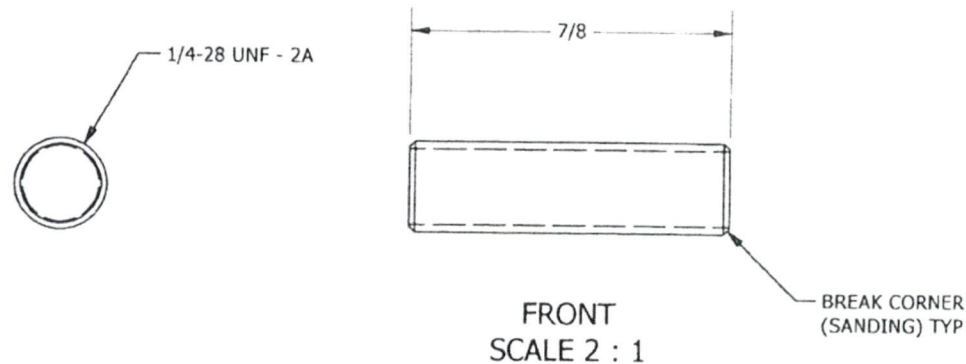
Barthelemy 2013 11 11

NOTES:

1. INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.5M 1994, DIMENSIONS AND TOLERANCING

2. REMOVE ALL BURRS AND SHARP EDGES 1/64" MAX. ENSURE EDGES ARE SMOOTH.

ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL	SPECIFICATION	SIZE
1	1	314-0004-15	BEARPAW - ICEBLADE THREADED ROD	SS304	ANNEALED	1/4-28 UNF - 2A



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DRAFTED BY:
G. LAPOINTE

DATE:
2006-04-24

CHECKED BY:

DATE:

APPROVED TCCA BY:
M. ZGELA

DATE:
2006-04-24

IF NOT SPECIFIED
GENERAL TOLERANCE

UNITS:
INCH

1/X ± 1/32
X.XX ± 0.010"
X.XXX ± 0.005"
ANG. ± 1°

SIZE
A
SCALE:
N/A

Helitowcart (Vanair inc.)
St-Nicolas, Levis, Qc, Canada
www.helitowcart.com

DEFINITION:
BEARPAW
ICEBLADE THREADED ROD

DRAWING NUMBER:

314-0004-15

REV
B

SHEET:

1 OF 1

REVISION				
REV	DESCRIPTION	REVISED BY	APPROVED	DATE
A	INITIAL ISSUE	G.LAPOINTE	M. ZGELA	2006-04-24
B	REMOVED REVISION LETTER FROM P/N	R.B.R.	M. ZGELA	2013-08-09

A. Barlow

2013 u

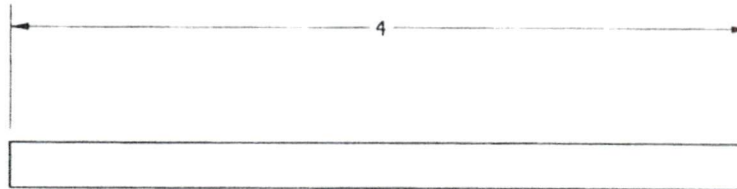
314-0004-15 rev B

NOTES:

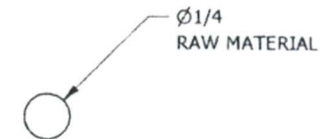
1. INTERPRET DRAWING IN ACCORDANCE WITH ASME Y14.5M 1994, DIMENSIONS AND TOLERANCING.

2. REMOVE ALL BURRS AND SHARP EDGES 0.020" MAX

ITEM	QTY	PART NUM	DESCRIPTION	MATERIAL	SPECIFICATION	SIZE
1	1	314-0002-	BEARPAW - ICE BLADE ASSEMBLY	SS304	ANNEALED	Ø 1/4" DIA.



FRONT
SCALE 1 : 1



RIGHT
SCALE 1 : 1

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DRAFTED BY:
G. LAPOINTE

DATE:
2006-04-24

CHECKED BY:

DATE:

APPROVED TCCA BY:
M. ZGELA

DATE:
2006-04-24

IF NOT SPECIFIED
GENERAL TOLERANCE

1/X ± 1/32
X.XX ± 0.010"
X.XXX ± 0.005"
ANG. ± 1°

UNITS:
INCH
SIZE
A
SCALE:
N/A

Helitowcart (Vanair inc.)
St-Nicolas, Levis, Qc, Canada
www.helitowcart.com

DEFINITION:

BEARPAW
ICEBLADE

DRAWING NUMBER:

314-0002-15

REV
B

SHEET:
1 OF 1

REVISION

REV	DESCRIPTION	REVISED BY	APPROVED	DATE
A	INITIAL ISSUE	G.LAPOINTE	M. ZGELA	2006-04-24
B	REMOVED REVISION LETTER FROM P/N	R.B.R.	M. ZGELA	2013-08-09

A. Barthelemy 2013.11.01

314-0002-15 rev B

4

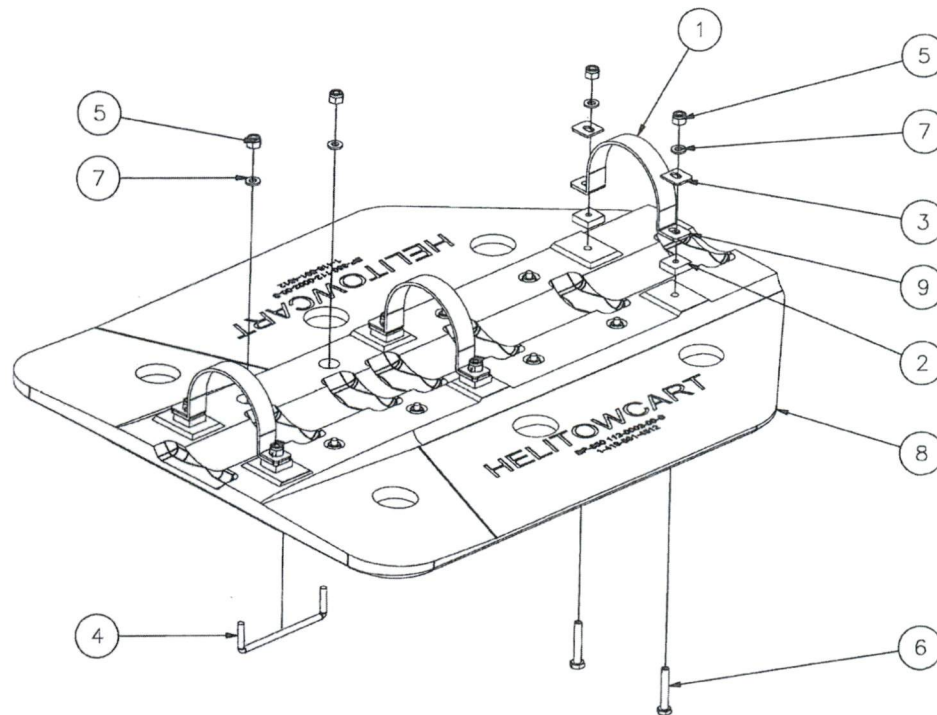
3

2

1

DWG NO 112-0002-00-S

1 OF 1



REVISIONS				DATE	STRESS
1	2	3	4		
REWORKABLE	NONREWORKABLE	NOTED	NA		
ZONE	REV	DESCRIPTION			
	A	ADDITION OF STREAMLINE PAD CONFIGURATION			
	B	ADDITION OF VENT HOLES ON THE STREAMLINE PAD			
	C	MODIFICATION OF VENT HOLES ON THE STREAMLINE PAD			
	D	DELETED REVISIONS IDENTIFICATION IN PART NUMBER			
	E	ADDED RECESSES FOR SKID WEAR SHOES AND LEAF SPRING			

NOTE: ICEBLADE ASSEMBLY, ITEM4, CAN BE OMITTED FROM INSTALLATION (OPTIONAL)

D. Bailean 2016 06 22

ITEM	QTY	PART NUMBER	DESCRIPTION	MATERIAL	SPECIFICATION	SIZE
1	3	314-0019-15	U SHAPED CLIP	STEEL		
2	6	314-0012-01	FILLER BLOCK	STEEL		1/4
3	6	314-0007-15	SLOTTED CLIP SUPPORT	STEEL		
4	4	314-0005-15	ICE BLADE ASSEMBLY	STEEL		1X6 1/4
5	14	262-0001-17	MD20365-42B	STEEL		1/4-28
6	6	261-0001-17	AN4-14A	STEEL		1/4-28 UNF
7	20	263-0001-17	AN96G-416	STEEL		1/4
8	1	314-0018-01-S	PAD STREAM LINE	POLYETHYLENE UHMW	BLACK	1
9	1	314-0021-01	SHRINK			

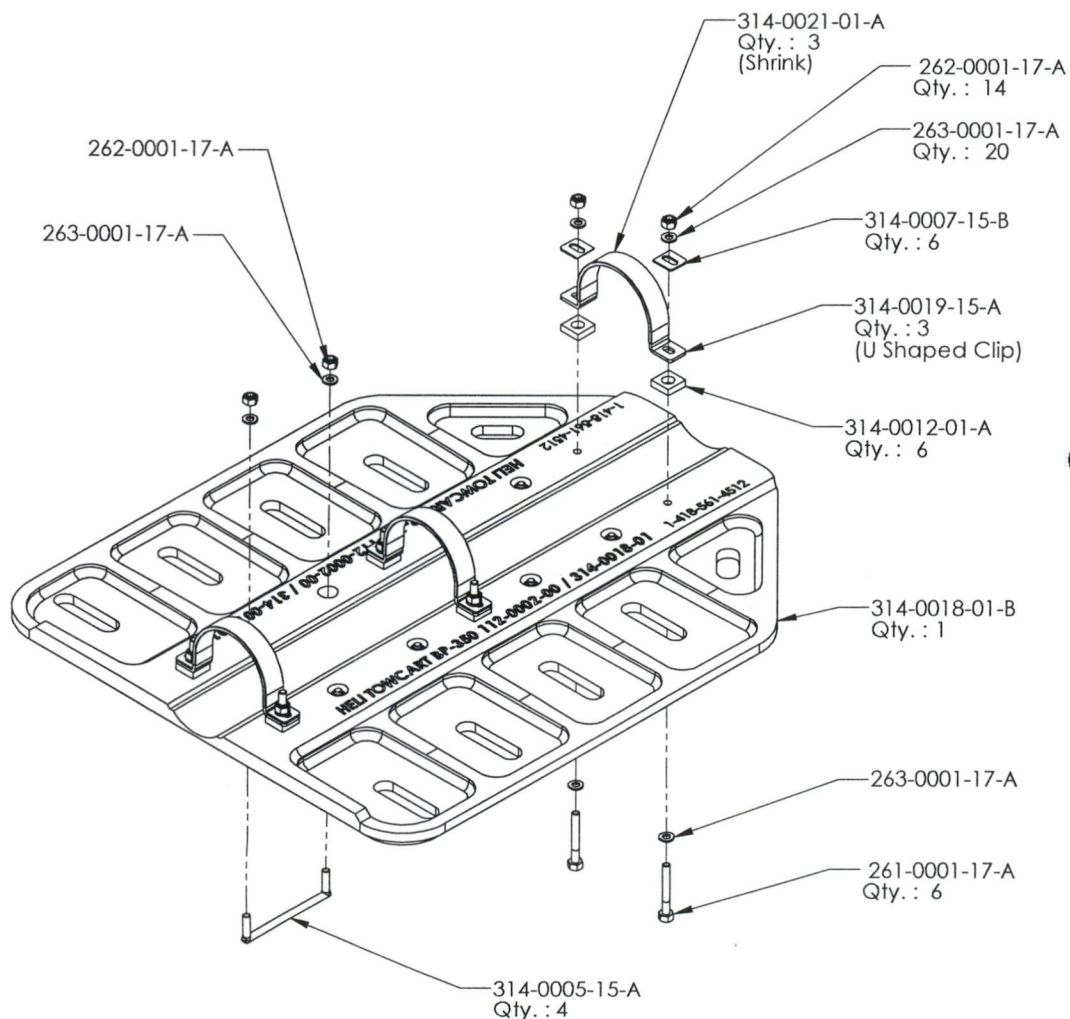
THE DESIGN DEPICTED IN THIS DRAWING IS THE EXCLUSIVE PROPERTY OF HELI TOW CART AND IN ACCEPTANCE OF THIS DRAWING THE RECIPIENT AGREES THAT IT WILL NOT BE USED FOR THE PURPOSE OF MANUFACTURE OR PROCUREMENT OF THE PART OR ASSEMBLY SHOWN HEREIN REPRODUCED OR OTHERWISE COPIED OR DISCLOSED TO ANY OTHER PERSON OR PARTY EXCEPT AS AUTHORIZED IN WRITING BY HELI TOW CART

DASH NO	NEXT ASSY	QTY PER ACT	MODEL	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	DRAWN: S. BERNIER 2008/07/31	DESIGNED: S. BERNIER 2008/07/31	CHECKED:	STRESS:	WEIGHT:	APPROVED:	APPROVED: M. ZGELA 2008/07/31	SCALE: NTS	CAD FILE # 112-0002-00-S Rev D 10/10/2010	Yondr Inc. 840 Apple Hill Rd St. Catharines, ON L9A 4P1 Tel: (905) 651-4512 Fax: (905) 651-2291 www.helitowcart.com
				LINEAR TOLERANCES: .XX ±0.030 XXX ±0.015 ANGULAR TOLERANCES: ±3.30° ALL MACHINE SURFACES: √										
				MATERIAL: MATERIAL SPEC. SIZE: HEAT TREAT: PROTECTION: IDENTIFYING METHOD:										

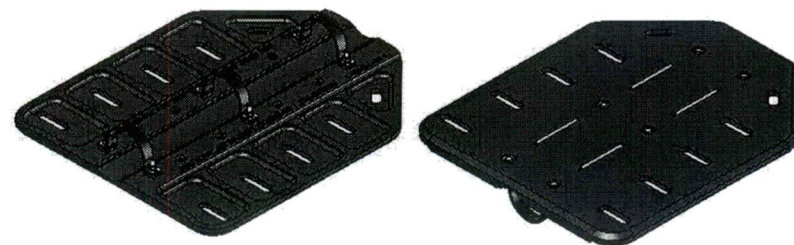
HELI TOW CART			
BEARPAW - BP350 ASSEMBLY STREAMLINE			
CAGE CODE	SIZE	DRAWING NO.	REV
		B 112-0002-00-S	E

D. Bailean 2016 09 27

112-0002-00-S. Rev E



No.	Qty.	Description	Part #	Rev #
1	1	Bearpaw BP-350 - Pad	314-0018-01	B
2	3	Bearpaw BP-350 - U shaped clip	314-0019-15	A
3	3	Bearpaw BP-350 - Shrink 1" x 6 1/4"	314-0021-01	A
4	6	Bearpaw - Slotted clip support	314-0007-15	B
5	6	Bearpaw - Filler Block 1/4"	314-0012-01	A
6	4	Bearpaw - Iceblade Assembly	314-0005-15	A
7	6	Bolt AN4-14A	261-0001-17	A
8	20	Washer AN960-416	263-0001-17	A
9	14	Nut MS20365-428	262-0001-17	A



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VERSION ENCORE ACTIVE, can be
(pour REP). NB i on

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Rev.	Description	Date	By
B	Change bolt size	20-nov.-06	G.L.
A	Initial Issue	29-sept.-06	G.L.

HELI TOW CART		anair inc. 1000, rue-Victorin St-Nicolas, Lévis (Québec) Canada, G7A 3S9 Tél. (418) 561-4512 Fax (418) 836-2291 www.helitowcart.com		THIS DOCUMENT IS PROPERTY OF VANAIR INC. WRITTEN PERMISSION FROM VANAIR INC. SHALL BE OBTAINED PRIOR TO COPYING, USING OR MODIFYING.
Title / Titre: Bearpaw BP-350 - Assembly				
Dessiné par / Drawing by: G.Lapointe	Date: (mm/dd/yyyy) 11/20/2006	Format: B	Échelle / Scale: 1:4	
Vérifié par / Checker by: [Signature]	Date: (mm/dd/yyyy) 11/20/2006	Dessin # / Drawing #: 112-0002-00	# Page: 1	
Approuvé par / Approved by: [Signature]	Date: (mm/dd/yyyy) 11-24-2006	Pièce # / Part #: 112-0002-00	Rev #: B	

112-0002-00-B

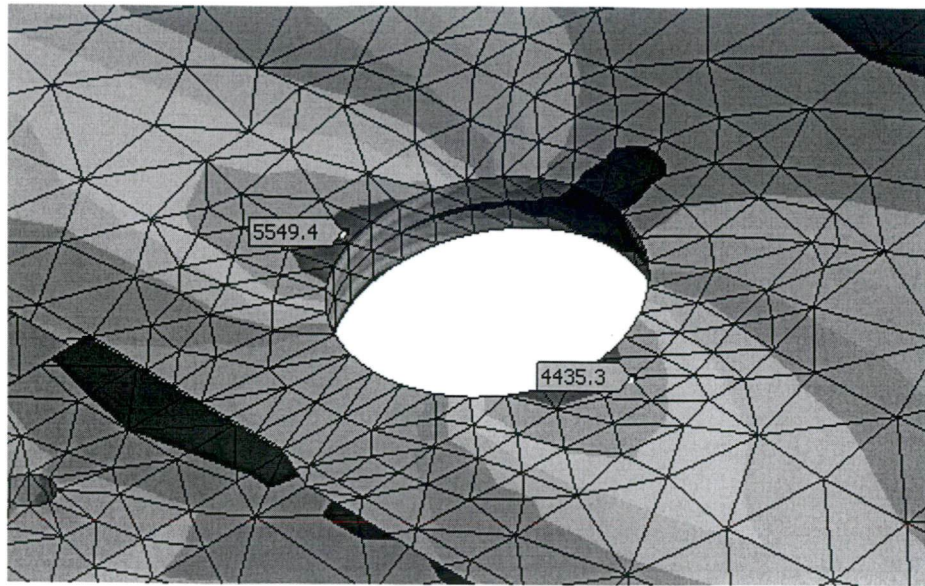


Figure 2 - Von Mises Hole Mapping Stress

The material is very ductile, so the peak stress in the hole edge can be ignored. The material ultimate tensile strength is 6800 psi which gives us a margin of safety of 1.53 is acceptable.

July 31, 2008

A2007_09

HTC-MEM-0709-001 Rev A

MEMORANDUM – VENT HOLE BP350 BEARPAW

Ref: HTC-EO-0709-002 Rev A, dated July 31, 2008

As per document HTC-EO-0709-002 Rev A, dated July 31 2008, a finite element model has been studied to ensure the structural substantiation of the new bearpaw. A comparison of the new model and the old is made.

Equivalent Stress

Type: Equivalent (von-Mises) Stress

Unit: psi

Time: 1

01/08/2008 09:47

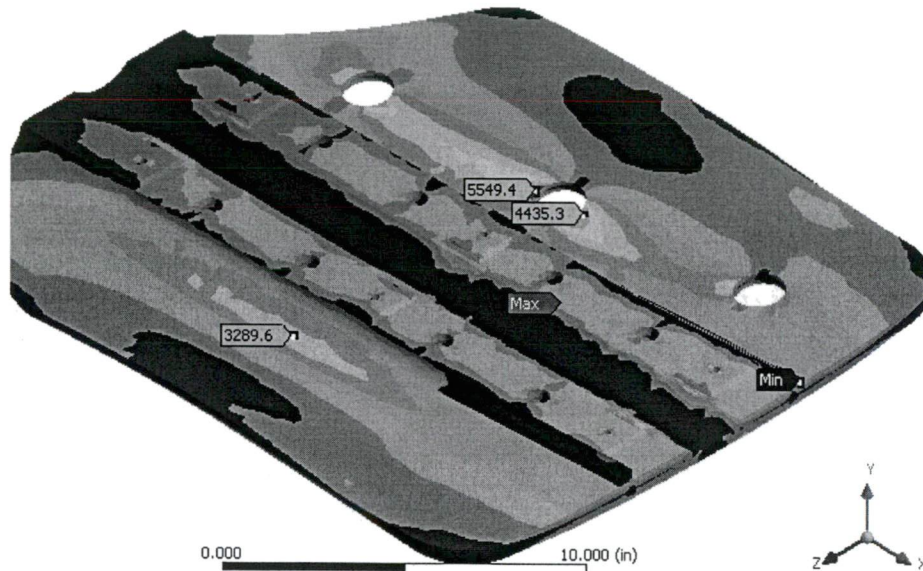
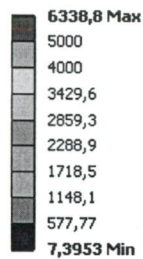


Figure 1 - Von Mises Mapping Stress

The model shows that the stress go by 3289 psi to 5549 psi. But 5549 psi is not the reality, if we take a closer look at the hole stress, see Figure 2, the stress is indeed lower 4435 psi.



BearPaw Model BP350

Rework Instructions:	
1	Drill the hole pattern as per drawing #VNR106-S, BearPaw BP350 Pad Streamline, Rev R03, dated July 31, 2008



Engineering Order

Title: Bear Paw Model BP350 Vent Holes				EO#: HTS-EO-0709-002 Rev A	
Prepared by: Simon Bernier	Design: N/A	Mech: N/A	Stress: N/A	Approved: Mirko Zgela (DAR #310)	Date: July 31, 2008
A/C Effectivity:	AS 350 D, B, B1, B2, B3 & BA AS 355				
Reference Documents:					
[a]	Drawings: #112-0002-00, BearPaw BP350 – Assembly, Rev C, dated July 31, 2008				
[b]	#VNR106-S, BearPaw BP350 Pad Streamline, Rev R03, dated July 31, 2008				
[c]	# HTC-MEM-0709-001, Memorandum – Vent Holes BP350 BearPaw, Rev A, dated July 31, 2008				
Reason for change: To reduce the possibility for the BearPaw to stick to the ground while performing landing & take off on muddy terrain.					
Description of change: To create a continuous path for the air, a number of holes are drilled into the Bear Paw pads.					
Previous Configuration: The old configuration was as per drawing #VNR106-S, BearPaw BP350 Pad Streamline, Rev A, dated Feb 29, 2008					
New Configuration: The new configuration of Bear Paw is as per drawing #VNR106-S, BearPaw BP350 Pad Streamline, Rev R03, dated July 31, 2008.					
Structural substantiation: The introduction of the vent holes has a negligible effect on the strength of the BearPaw and is documented in the following memorandum # HTC-MEM-0709-001, Memorandum – Vent Holes BP350 BearPaw, Rev A, dated July 31, 2008					

Transport Canada Civil Aviation

LSTC or STC

Simple External Modification - Applicant's Flight Test Plan/Report

Aircraft Type: Eurocopter AS-350 Series Registration / Ser No: C-GZCN/2207

Modification Description: Installation of Helitowcart BearPaw as per STC: SH06-24 Issue #2

Modification Drawing Number: Installation conforms to Master Document List, HTC-MDL-BP-AS350/355-1000, "Eurocopter Model AS 350/355 Series Helicopters - Installation of BearPaw Model BP350", Rev A.

Installation is performed as per: HTC-314-0020-00-A, "BearPaw Model BP350 - Installation Instructions - AS350/355 Series Helicopters", Rev A.

Date of Flight: Nov 21, 2006 Location of Flight: CYQR - HTS

Test Weight: 3688 lbs Test CG:

Configuration (List All External Mods): Configuration #1: Clean helicopter (Baseline)

Configuration #2: BearPaw installed as per HTC-314-0020-00-A, "BearPaw Model BP350 - Installation Instructions - AS350/355 Series Helicopters", Rev A.

Note: Two flights will be required, one clean to be used as baseline the other with the BearPaw installed.

TEST RESULTS

Test	Characteristics to Look For	Initial if Satisfactory
1. 527.309 - Design Limitation (c) & (d)	Perform forward rearward and sideward flight (left & right) at maximum speed. Note the following: <ul style="list-style-type: none"> - Abnormal vibration of the airframe - Abnormal vibration of BearPaw - Large displacements of BearPaw - Controllability of the helicopter 	Y
2. 527.251 Vibration	Perform forward rearward and sideward flight (left & right) at maximum speed. Note the following: <ul style="list-style-type: none"> - Abnormal vibration of the airframe - Abnormal vibration of BearPaw - Large displacements of BearPaw - Controllability of the helicopter 	Y
3. 527.629 Flutter	Perform a shallow dive at VNE. Note the following: <ul style="list-style-type: none"> - Abnormal vibration of the airframe and rotor blade - Abnormal vibration of BearPaw - Large displacements of BearPaw - Controllability of the helicopter 	Y

I hereby attest that I have flown (Model) Model AS-350 (Registration) GZCN (Serial Number) 2207 with the above modification(s) installed and that this aircraft exhibited the flight characteristics and performance of a standard AS-350 when the modified with the above modification.

Pilot I/C

Signature: Michael BuissieresDate: Nov 21, 2006Pilot's Name: MICHAEL BUSSIÈRESPilot's License No: CH 209660

If applicable - DAR's Signature

DAR's Name/No: DAR #310Mirko Zgela

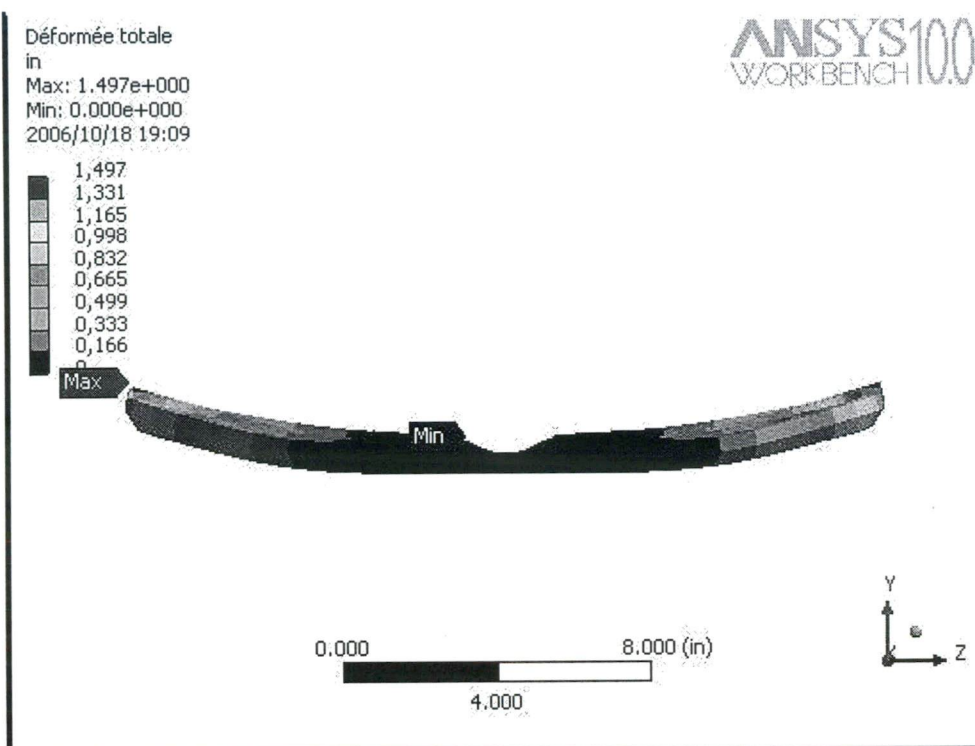
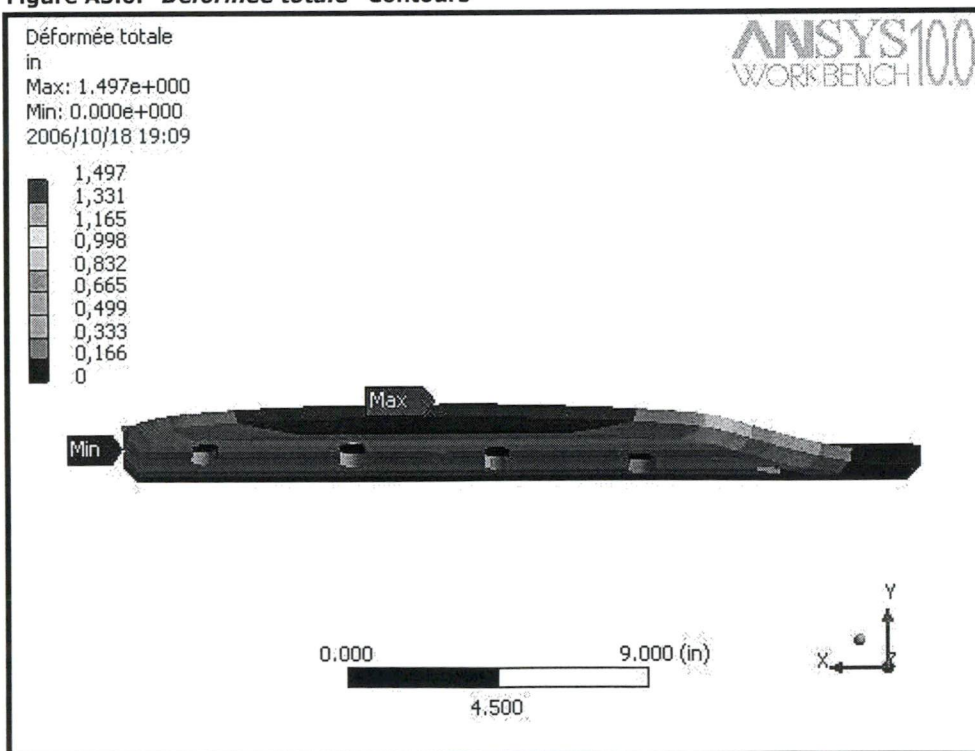


Figure A5.6. "Déformée totale" Contours



A6. Scénario 6 Figures

Figure A6.1. "Environnement" Geometry

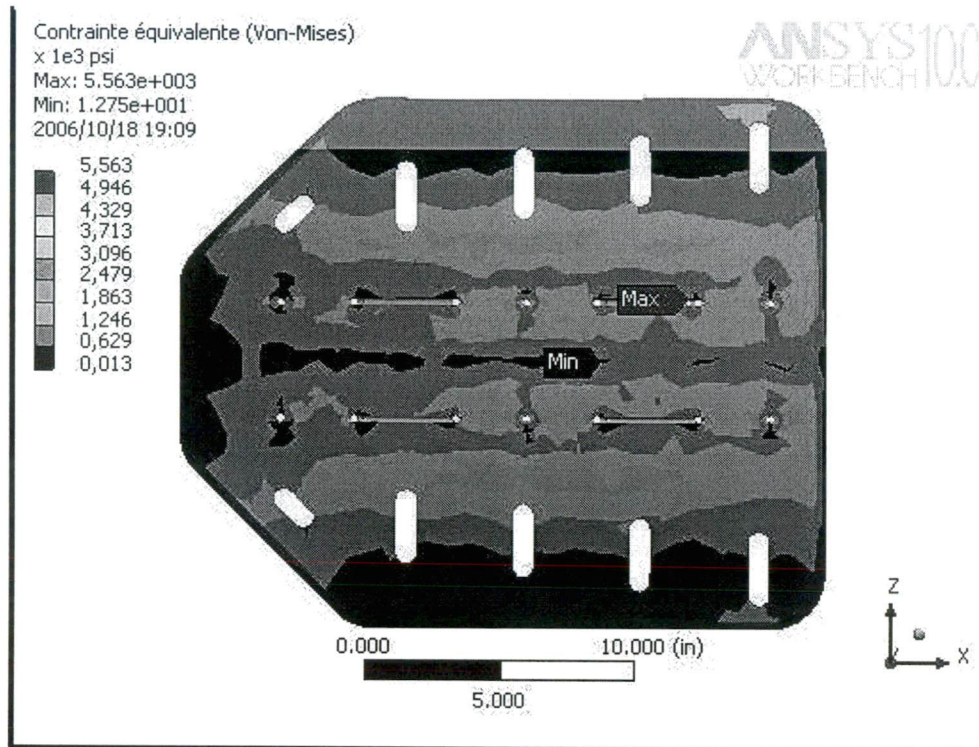


Figure A5.4. "Contrainte équivalente" Contours

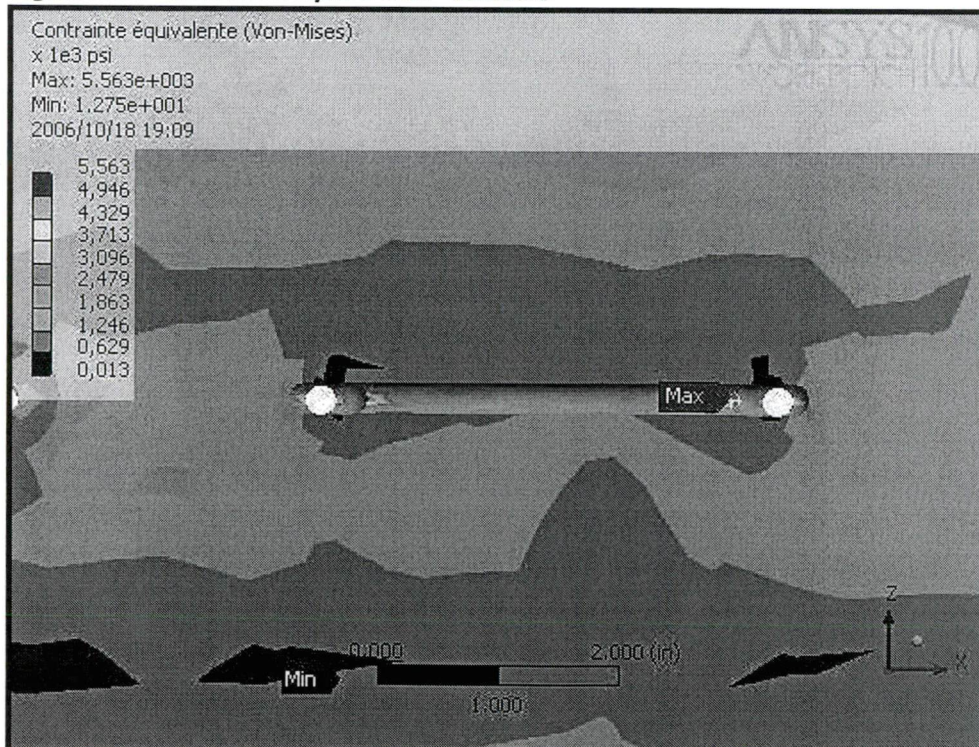


Figure A5.5. "Déformée totale" Contours

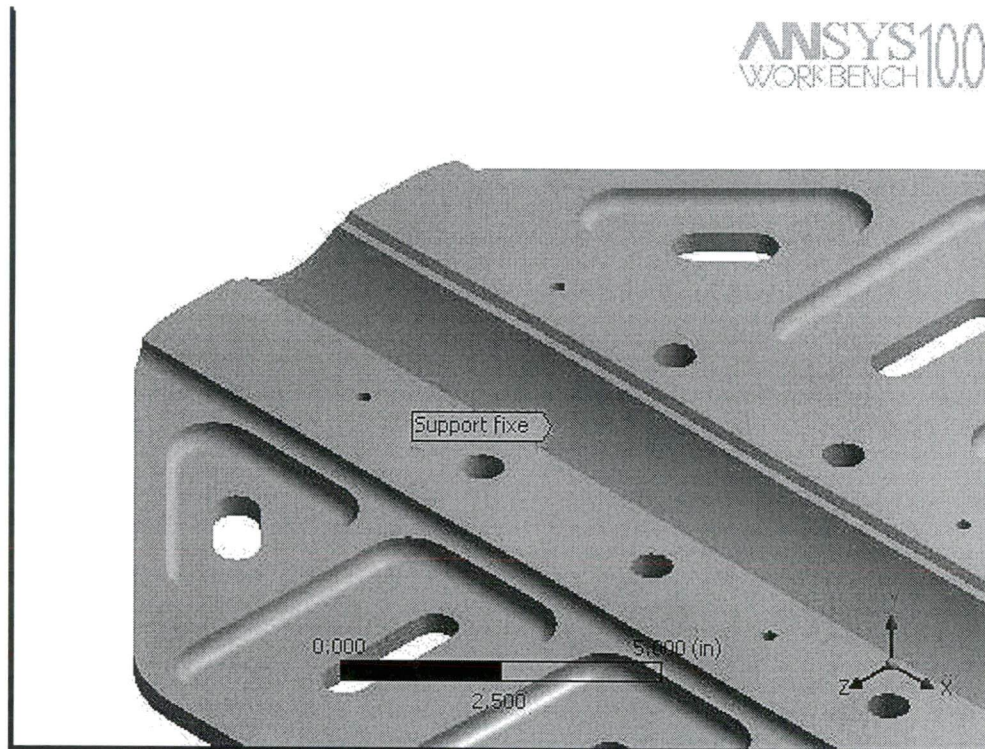


Figure A5.2. "Contrainte équivalente" Contours

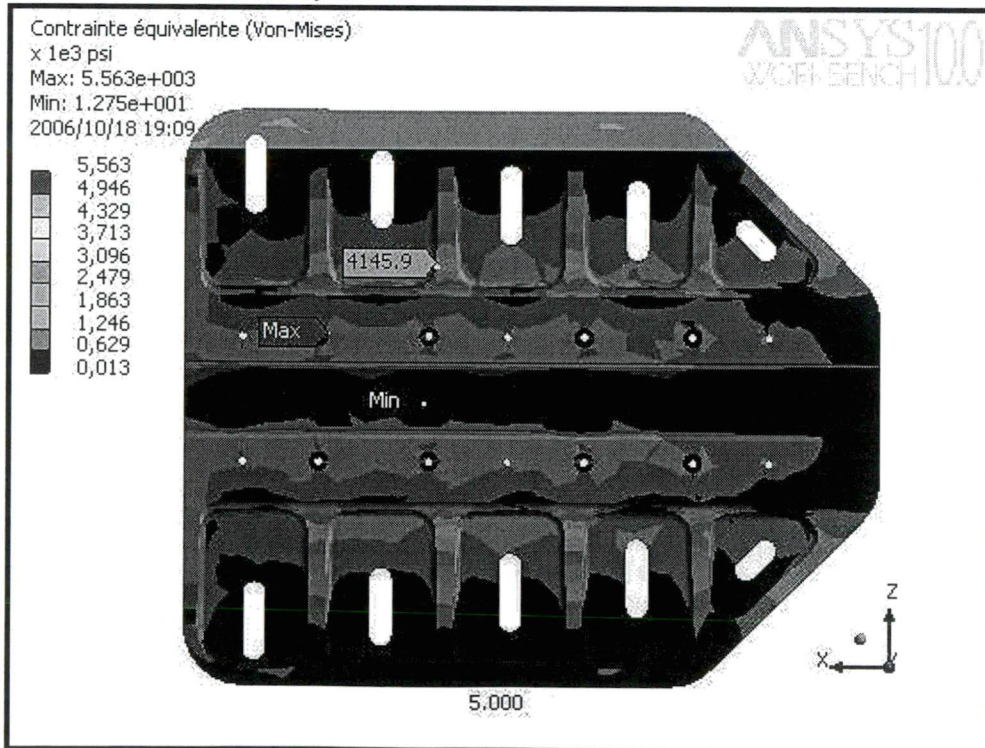
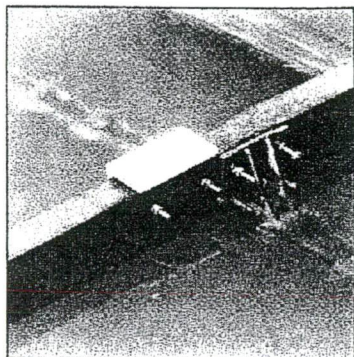


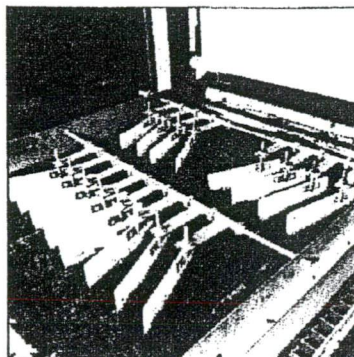
Figure A5.3. "Contrainte équivalente" Contours

Appendix B
FEA Static Analysis
BearPaw Pad

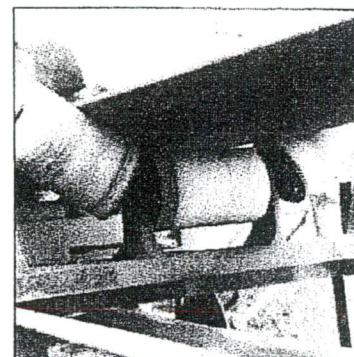
Propriétés du UHMW TIVAR®



TIVAR flight wear shoes do not corrode, and outwear shoes made from metals, urethanes and other plastics.



TIVAR is used in many OEM applications to solve abrasion and corrosion problems. The scrapers on this belt press are of TIVAR.



Conveyor rollers lined with TIVAR reduce belt wear. Wet sludge doesn't build up as on conventional rollers.

PHYSICAL PROPERTIES			
PROPERTY	TEST METHOD	UNIT	TYPICAL VALUE
Specific Gravity	ASTM D-792	g/cm ³	0.94
Yield Strength @ 73°F	ASTM D-638	p.s.i.	3400
Ultimate Tensile Strength @ 73°F	ASTM D-638	p.s.i.	6800
Break Elongation @ 73°F	ASTM D-638	%	450
Yield Strength @ 250°F	Stress Strain Diagram	p.s.i.	700
Ultimate Tensile Strength @ 250°F	Stress Strain Diagram	p.s.i.	3300
Break Elongation @ 250°F	Stress Strain Diagram	%	900
Hardness — Rockwell "R" Scale	ASTM D-785	—	64
Shore "D" Scale	ASTM D-2240	—	67
Flexural Modulus of elasticity	Bend Creep/1 min. value	p.s.i.	110,000
Shear Strength	ASTM D-732	p.s.i.	3500
Izod Impact + @ 23°C	ASTM D-256A	ft-lbs/in. notch	No Break
- @ 140°C	ASTM D-256A	ft-lbs/in. notch	No Break
Environmental Stress Cracking @ F ₅₀	ASTM D-1693 Mod	hrs.	6000
Water Absorption	ASTM D-570	—	NIL

COEFFICIENT OF FRICTION

UHMW Polymer has a lower coefficient of friction than glass. Together with its self-lubricating characteristics it is an ideal material for bearings, bushings, valves, wear strips or any application where sliding contact is encountered.

MATERIALS	STATIC	KINETIC	TEST METHOD
Mild Steel vs. Mild Steel	0.30-0.40	0.25-0.35	ASTM D-1894
Mild Steel vs. TIVAR-100	0.15-0.20	0.12-0.20	
TIVAR-100 vs. TIVAR-100	0.20-0.30	0.20-0.30	

DEFORMATION UNDER COMPRESSION - %							PERMANENT DEFORMATION AFTER REMOVAL OF LOAD	
TEMP °F	PSI COMPRESSION	INITIAL LOADING					AFTER 1 MIN.	AFTER 24 HRS.
		10 MIN.	100 MIN.	1000 MIN.	1 DAY	56 DAYS		
68°	282	1.5	1.7	1.8	1.9	2.4	0.9	0.6
	570	2.4	2.5	2.7	3.0	4.0	1.5	1.2
	850	3.0	4.0	4.5	5.0	5.1	2.7	1.6
	1140	4.0	5.0	6.0	7.0	7.5	3.6	2.4
	1420	5.0	6.5	7.5	8.0	9.0	4.5	2.9
	1700	7.0	7.5	8.0	10.0	11.0	5.4	3.5

CHEMICAL RESISTANCE

Hydrochloric acid (conc.) - no appreciable reaction up to 80°C

Nitric acid (20%) - less than 20% decrease in yield stress and ultimate tensile strength up to 80°C.

Sulphuric acid (50%) - no appreciable reaction up to 80°C. Less than 20% decrease in properties at 75% concentration.

Sodium hydroxide (caustic soda) - no appreciable reaction up to 80°C.

Sodium hypochlorate and most aqueous solutions of inorganic salts - no appreciable reaction up to 80°C.

Hydrocarbons and halogenated hydrocarbons - limited resistance. Each application should be evaluated.

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 MONTRÉAL : 7600, Rte Transcanadienne, St-Laurent, QC, H4T 1A5 Tél. : 514-738-6817 ou 1-888-506-9600

Helitowcart 314-0008-01-A

2006-05-23

1 of 1

Appendix A

Material Properties

$$B_{RD} = 3500 \times 0.25 \times 0.67 = 586 \text{ lbs}$$

The bearing load will be distributed equally between the six AN4 bolts. So each bolt will have a bearing load F_b of $562/6 = 93 \text{ lbs}$.

and;

$$MS = B_{RD} / F_b \quad (5)$$

Where;

$$MS = 586/93 = 6.25$$

5.0 CONCLUSIONS

Based on the above analysis the BearPaw Model BP350 installation on the AS 350 series helicopters is deemed structurally acceptable.

6.0 REFERENCES

- [1] Bruhn, "Analysis and Design of Flight Vehicle Structures", Second Edition, June 1973.
- [2] Shigley, Joseph E., "Mechanical Engineering Design", Second Edition, 1963.

This local moment will be reacted by shear stresses resulting from the applied torsion in the clip cross section. The shear stresses F_{SRD} will be given by:

$$F_{SRD} = (3 \times M_{RD}) / (b \times t^2) \quad (4)$$

Where;

$$\begin{aligned} M_{RD} &= \text{Local moment} = 121 \text{ in-lbs (Ultimate)} \\ b &= \text{Clip cross sectional length} = 0.75 \text{ in.} \\ t &= \text{Clip thickness} = 0.109 \text{ in.} \end{aligned}$$
$$\begin{aligned} F_{SRD} &= (3 \times 121) / (0.75 \times 0.109^2) \\ &= 38 \text{ KSI} \end{aligned}$$

and;

$$MS = F_{su} / (F_{SRD}) \quad (5)$$

Where;

$$\begin{aligned} F_{su} &= 40 \text{ KSI (From Bhrun page B2.9)} \\ MS &= 40/40,1 = 1.0 \end{aligned}$$

The low MS is acceptable since the analysis approach is very conservative and that some of the drag load is also reacted by the BearPaw surface contacting the skid.

4.4 Shear and Bearing Failure – U Shape Attaching Bolts

Shear:

The drag load F_d , will be equally distributed amongst the six AN4-14A bolts. Each of these bolts can take up to 3600 lbs in single shear. These are therefore passed by inspection.

Bearing:

The allowable bearing load B_{RD} for the UHMW TIVAR material will be given by:

$$B_{RD} = F_{Bru} \times D \times T \quad (6)$$

Where;

$$\begin{aligned} F_{Bru} &= \text{Bearing strength conservatively assumed to be equal to the shear strength} = 3500 \text{ psi (From Annex A)} \\ D &= \text{AN4 Bolt Diameters} = 0.25 \text{ in.} \\ t &= \text{Plate thickness at bolt hole} = 0.67 \text{ in.} \end{aligned}$$

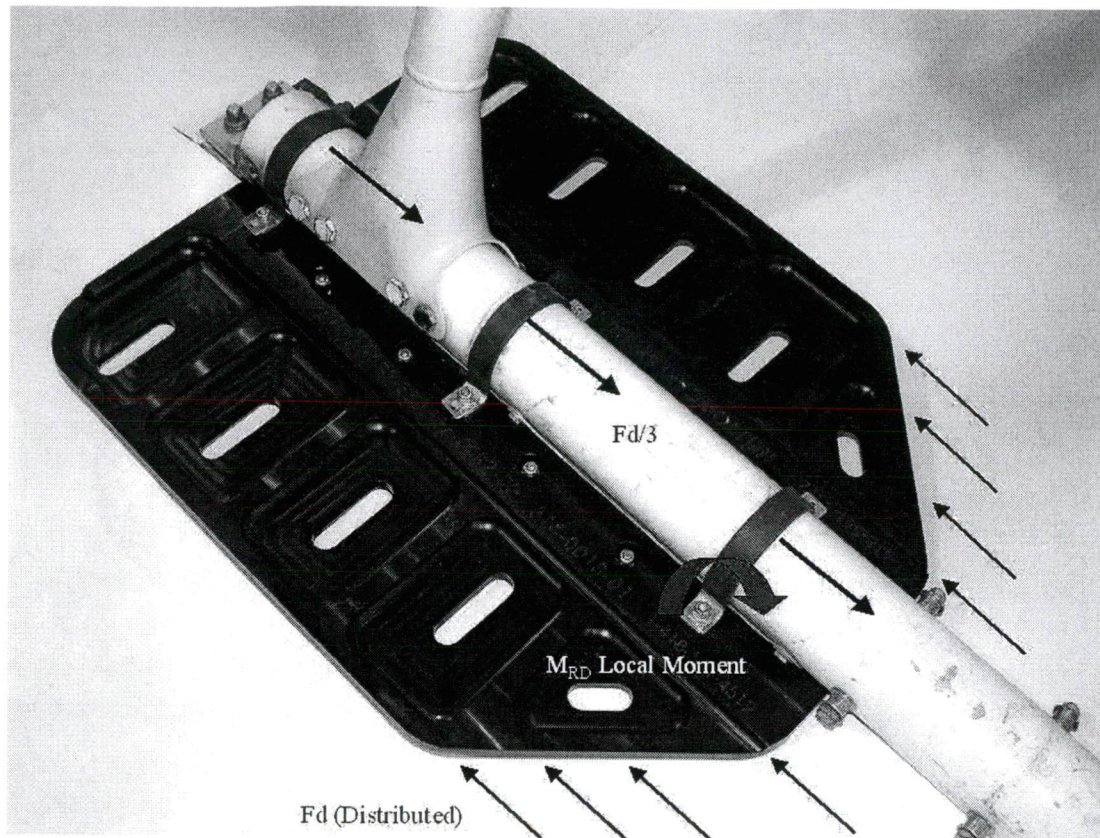


Figure (2) – U-Shape Clip Local Moment due to Drag Load

Assuming that the local moment will be distributed equally between the six attachment bolts, the local moment will be given by;

$$M_{RD} = (F_d \times l_m) / 4 \quad (3)$$

Where;

F_d = Total drag load = 17% of F_w = 562 lbs
 l_m = Distance between the mid section of the skid tube to the bottom of clip = 1.30 in. Since the reaction is taken by friction along the circumference of the U shape clip.

$$M_{RD} = (562 \times 1.3) / 6 = 121 \text{ lbs-in}$$

4.2 BearPaw Pad Failure (Drw# VNR106)

In order to evaluate the BearPaw pad a Finite Element Analysis was conducted using the ANSYS 10.0 Finite Analysis Code. The BearPaw structure was subjected to the application of the combined loading F_d and L_{BP} . The drag load F_d was scale up to 30 % of L_{BP} to account for variability in static friction coefficient for different soils conditions.

The L_{BP} load was distributed as a uniform pressure underneath the BearPaw and the F_d was distributed as a uniformly distributed load along the leading edge of the BearPaw acting opposite to the direction of flight (ground run).

The boundary conditions selected restrained the BearPaw model in all three translation axes, but allowed rotations to occur along its longitudinal axis of symmetry since the stainless steel clips attaching the BearPaw to the skid tube can allow some rotations. The result of the analysis is provided as Annex B. As shown in Annex B the maximum stress in the BearPaw pad is located on top of the stiffeners. The two middle stiffeners being the more heavily loaded, the Von Misses stress ranging from 2.7 to 3.0 ksi.

As such we have:

$$MS = F_{tu} / (1.5 \times F_{ap}) \quad (2)$$

Where;

$$F_{tu} = 6800 \text{ psi (From Annex A)}$$

$$F_{ap} = \text{Applied stresses resulting from design loads} = 3.0 \text{ ksi}$$

$$MS = 1.33$$

4.3 Failure of Stainless Steel U Shape Clip (Drg# VNR107)

The most probable failure of the U shape steel clip would be from the local moment M_{RD} resulting from the drag load application. The loading action is as shown in Figure (2).

$$\begin{aligned}W_T &= \text{Total weight of the helicopter maximum} = 5732 \text{ lbs for AS 355N} \\A_T &= \text{Foot print area of the cross tube} = 98.0" \times 3.0" = 294 \text{ (in}^2\text{)} \\A_{BP} &= \text{Foot print area of the BearPaw} = 401.0 \text{ (in}^2\text{)} \\A &= \text{Total foot print area of the BearPaw and cross tube combined} = \\&\quad 695.0 \text{ (in}^2\text{)}\end{aligned}$$

Solving for a maximum gross weight of 5732 lbs we have;

$$\begin{aligned}L_{CT} &= \text{Load acting on cross tube} = 2424 \text{ (lbs)} \\L_{BP} &= \text{Load acting on BearPaw} = 3307 \text{ (lbs)}\end{aligned}$$

It will also be assumed that the foot print load will be distributed evenly underneath the BearPaw foot print. The drag force F_d resulting from this load L_{BP} can be approximated by:

$$\begin{aligned}F_d &= \mu L_{BP} \\F_d &= 0.17 \times 3307 = 562 \text{ lbs}\end{aligned} \tag{2}$$

Where;

$$\begin{aligned}\mu &= \text{Bearpaw static friction coefficient 0.17 (from Annex A);} \\L_{BP} &= \text{BearPaw foot print load from above} = 3307 \text{ lbs}\end{aligned}$$

3.3 Factors

Based on the AWM requirements, the following factors will be used in the detailed stress analysis if required:

- a) a factor of 1.5 to go from limit to ultimate load
- b) a factor of 1.15 to be used as fitting factor since the equipment will be subjected to significant vibrations; and
- c) no special factor is needed.

4.0 DETAILED STRESSING

4.1 Failure Modes

The following failures modes have been evaluated;

- Failure of BearPaw pad resulting from the combined loading F_d and L_{BP} ;
- Failure of the stainless steel clip due to the application of F_d ;
- Failure in shear and bearing of the stainless steel clip attaching bolts.

VNR107	BearPaw BP350 – U Shaped Clip	R01	Oct 3, 2006
VNR089	Bearpaw – Slotted Clip Support	R04	July 31, 2006
VNR099	Filler Block 1/4"	R01	Aug 8, 2006

2.3 Material Properties

All material properties used in the analysis have been extracted from the MIL-HDBK-5F or material specifications relevant to the material used. Annex A provides the UHMW TIVAR[®] material properties.

3.0 STRUCTURAL LOADS

3.1 Structural Loading Action

The helicopter BearPaw will be subjected to both maneuvering and ground loading actions. The BearPaw has a very small cross-section and is of light weight construction, as such, the only significant loads will be generated by the ground loading actions of the helicopter resting on its skids. Consequently only the ground loads will be considered in the analysis.

3.2 Ground Design Loads

Since the BearPaw is attached to the skid tube, it would be appropriate to use the AWM 527.501 (f) (2) Ground Load conditions to derive the design loads for the BearPaw. These would however not be realistic since they are mainly used to size the diameter of the skid tube.

Since the BearPaw only covers a very limited section of the skids it can be confidently stated that the BearPaw installation would only take a portion of the landing gear load generated during the landing. In fact, only a small portion of the landing loads would be taken by the BearPaw in all possible landing conditions. The BearPaw would also be subjected to drag loads resulting from running landing.

In order to derive the design loads for the BearPaw it is assumed that the entire weight of the helicopter will be distributed on one skid only. Furthermore it is assumed that the loads between the BearPaw and the loaded skid tube will be distributed proportionally to the respective foot prints of the BearPaw and skid tube. This is also a conservative assumption for all possible landing conditions. As such we have;

$$W_T = A_T/A \times L_{CT} + A_{BP}/A \times L_{BP} \quad (1)$$

Where:

and six AN-4 bolts. The BearPaw pad has a machined recess on its centerline that perfectly matches the cross tube contour providing a smooth skid bearing loads. The total weight of the installation is less than 21 lbs. A typical BearPaw Model BP350 installation on an AS 350 helicopter is shown in Figure (1).

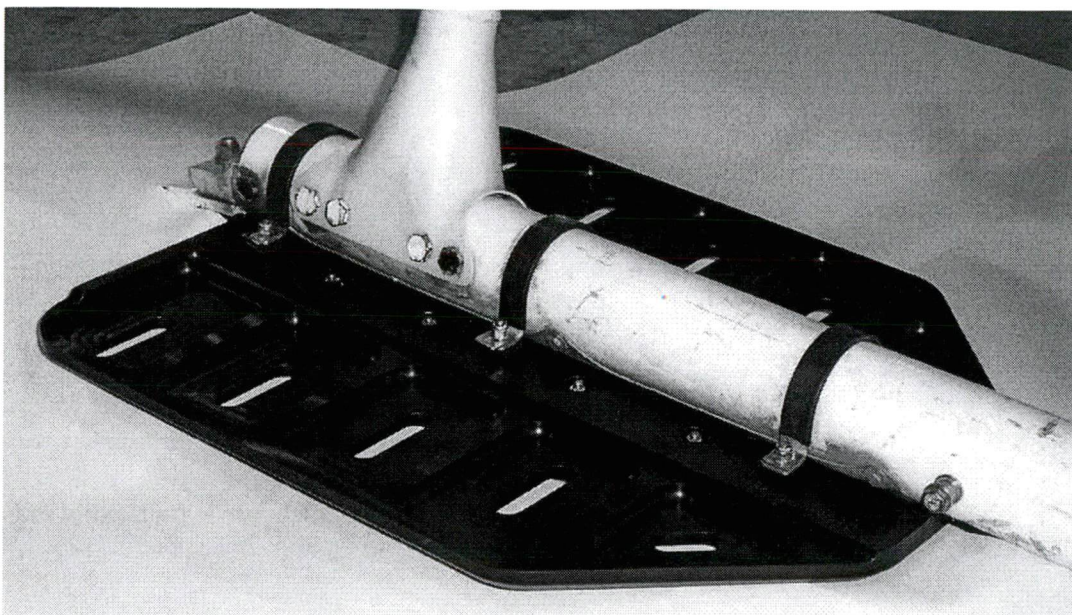


Figure (1) – Installation of BearPaw Model PB350 on AS 350 Helicopter

2.2 Applicable Drawings & Configuration

The following drawings define the structural configuration of the BearPaw Model BP350 and have been used in the analysis.

Drawings #	Title	Revision Status	Date
112-0002-00	BearPaw BP350 - Assembly	B	Nov 20, 2006
VNR084	BearPaw – Iceblade	R01	Apr 24, 2006
VNR085	BearPaw – Iceblade Threaded Rod	R01	Apr 24, 2006
VNR086	BearPaw – Iceblade Assembly	R01	Apr 24, 2006
VNR106	BearPaw BP350 - Pad	R02	Nov 20, 2006

1.0 INTRODUCTION

1.1 Purpose

This document provides the structural substantiation for the installation of the Helitowcart BearPaw Model BP350. More specifically this report will demonstrate compliance to the following AWM 527 airworthiness requirements:

AWM 527	Requirements
27.301	Loads
27.305	Strength & Deformation
27.307	Proof of structure
27.337	Maneuvering conditions
27.501	Ground Load Conditions – Landing Gear with Skids
27.603	Material Strength Properties
27.619	Special Factor
27.623	Bearing Factor
27.625	Fitting Factor

1.2 Background

Helitowcart is a company that design, manufacture and distribute ground handling devices for light to medium weight helicopters. Its mission is to design and to provide reliable and secure products, capable of multiple applications while incorporating superior aesthetics. In order to increase its product line basis, Helitowcart has recently developed a BearPaw design for the Robinson R44 helicopter (TCCA SH06-24). The model BP350 BearPaw is a similar design that can be installed on the AS350 and AS355 series helicopters. This design requires also airworthiness approval.

2.0 PROPOSED MODIFICATION

2.1 Modification Description

The Helitowcart BearPaws are made of machined UHMW TIVAR® polymer 1.0 in. sheet material. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability provides superior performance. The UHMW Polymer has a lower coefficient of friction than glass. Together with its self lubricating characteristics is an ideal material for this design application where sliding contact is encountered.

The machined BearPaw is attached to the R/H and L/H helicopter aft skid tubes where the aft cross tube attaches. The BearPaw is attached to the skids using three stainless steel bands

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Annex A – Propriété du UHMW TIVAR[®]

Annex B – Detailed FEA of BearPaw

List of Figures

Figure (1) – Installation of BearPaw Model PB350 on AS 350 Helicopter

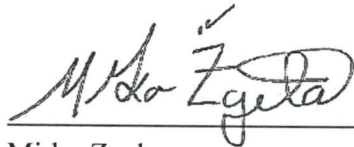
Figure (2) – U-Shape Clip - Local Moment due to Drag Load

Aviatech Airworthiness Consultants

4100 Renoir
Trois-Rivières, (QC)
G8Y 6Y6

Aviatech Airworthiness Consultants**Structural Substantiation
Helitowcart BearPaw Model BP350****Report: STR-BP-AS350/355-1000 (Rev NC)**

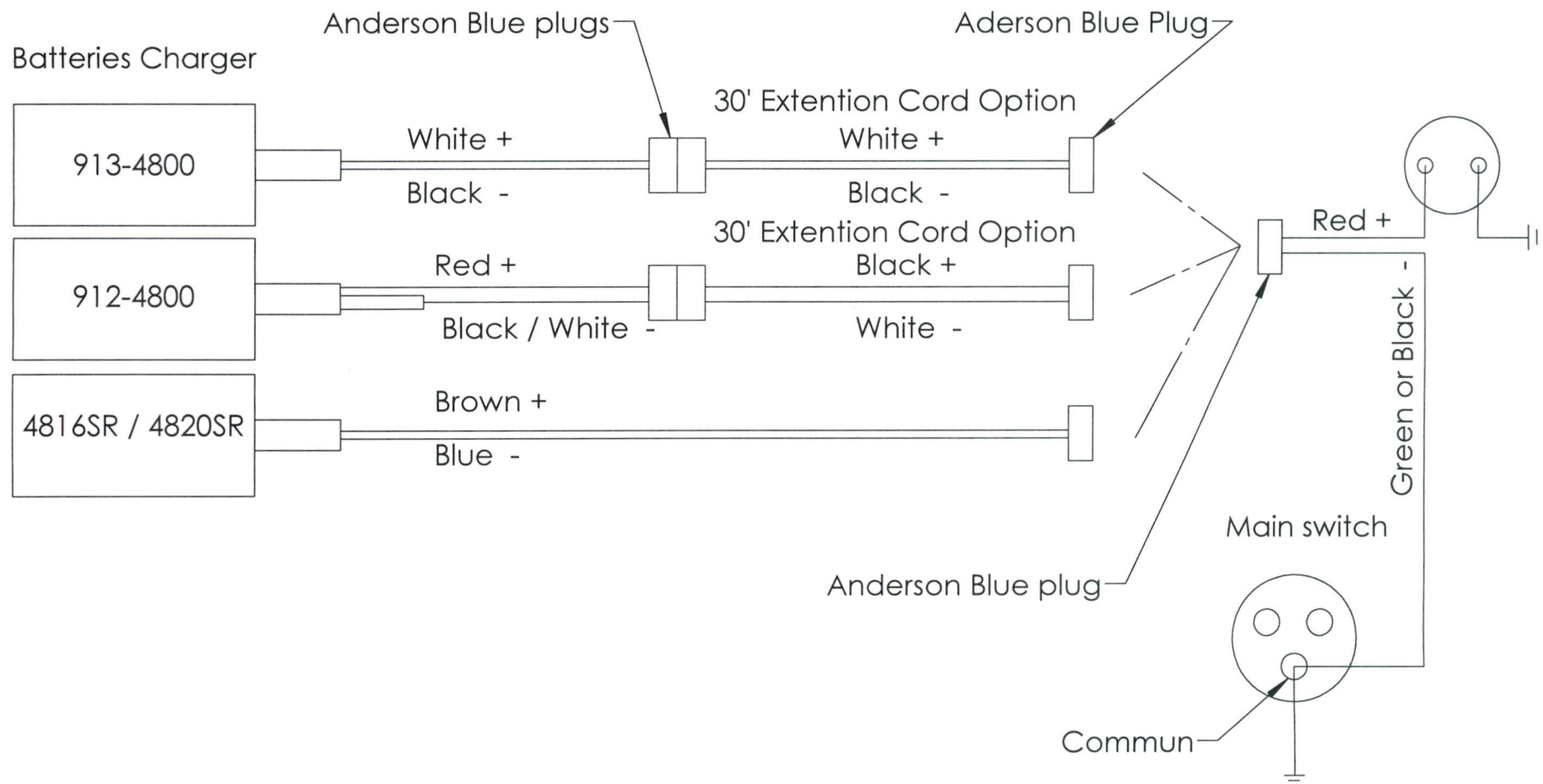
APPROVED BY:

DATE: Nov 20, 2006

Mirko Zgela
Design Approval Representative DAR #310

Revision	Revision Date	Revision of Entry	Entered by

Batt. Ind.



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DIMENSIONS ARE IN INCHS (mm)		DRAWN		J.C.						2016-06-22			
TOLERANCES:		CHECKED		J.C.						-- -- -- --			
\angle : MACH \pm 0.5° BEND \pm 1°		ENG APPR.		-		--		DESCRIPTION: V1000 IEC to Anderson Conversion Kit Electric Diag.					
x/xx = \pm 1/32"		MFG APPR.											
x.x = \pm 0.030"		Q.A.											
x.xx = \pm 0.020"													
x.xxx = \pm 0.005"													
MATERIAL								SIZE		DWG. NO.		REV	
FINISH								A		JC160622-01-A		0	
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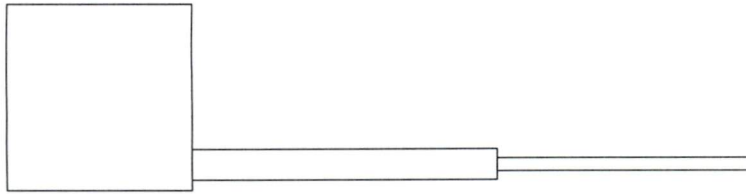
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X.X = ± 0.030"		Q.A.			
X.XX = ± 0.020"					
X.XXX = ± 0.005"					
MATERIAL		Steel		SIZE DWG. NO.	
FINISH		sd		REV	
DO NOT SCALE DRAWING		QTY BY MACHINE : 1		SCALE: 1:2 WEIGHT: SHEET 2 OF 3	

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DESCRIPTION:

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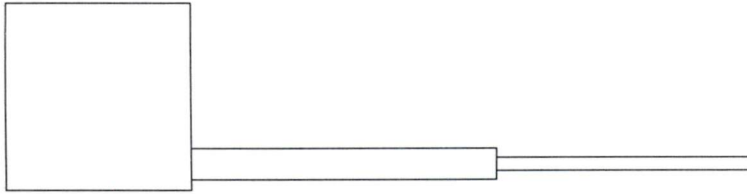
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TOLERANCES:		CHECKED	J.C.				
∠: MACH ± 0.5° BEND ± 1°		ENG APPR.	-			-	
X/XX = ± 1/32"		MFG APPR.			DESCRIPTION:		
X.X = ± 0.030"		Q.A.					
X.XX = ± 0.020"							
X.XXX = ± 0.005"							
MATERIAL		Steel			SIZE	DWG. NO.	REV
FINISH		sd			V1000_AEC_TO_ANDERSON RETROFIT		
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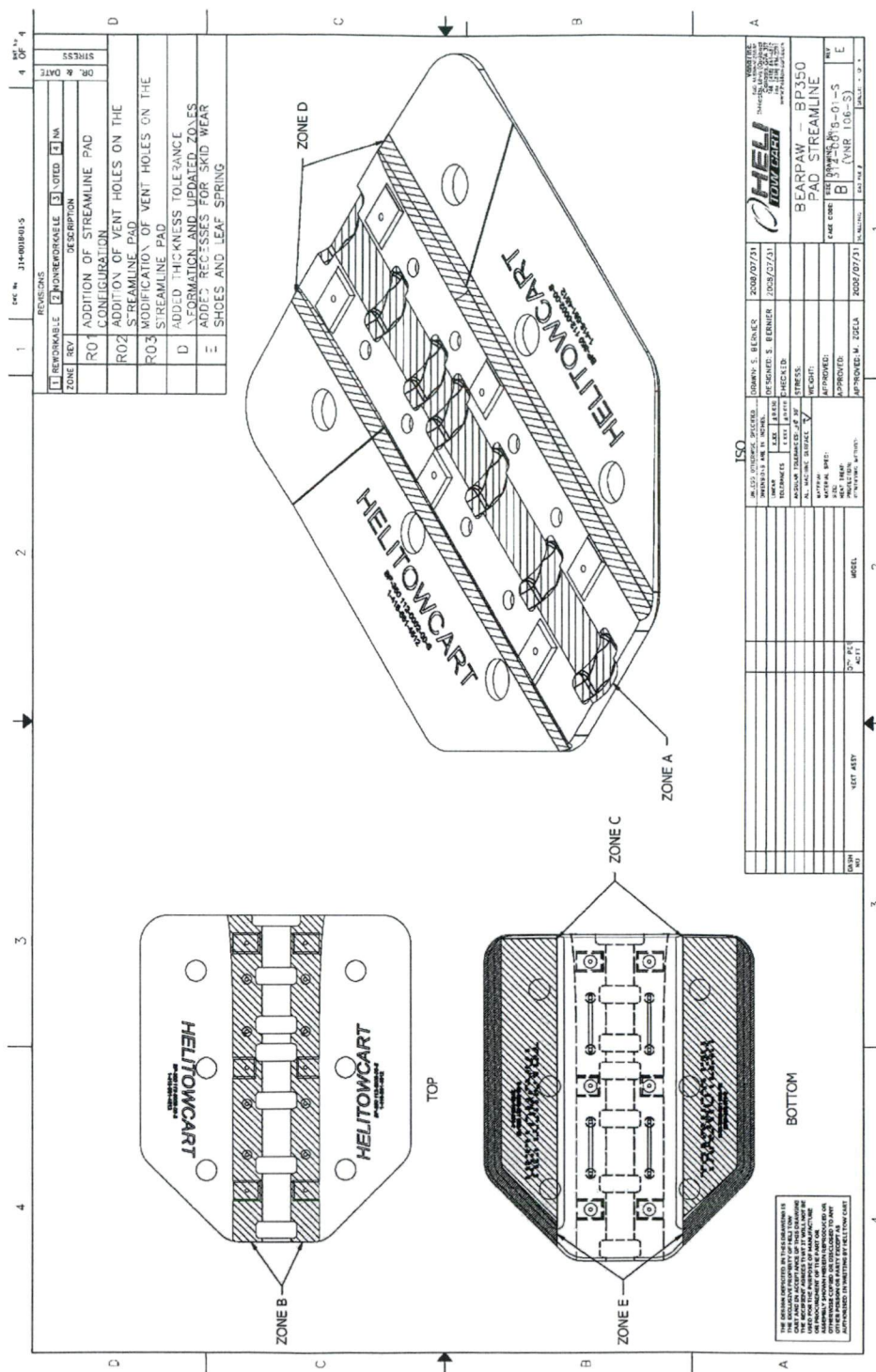
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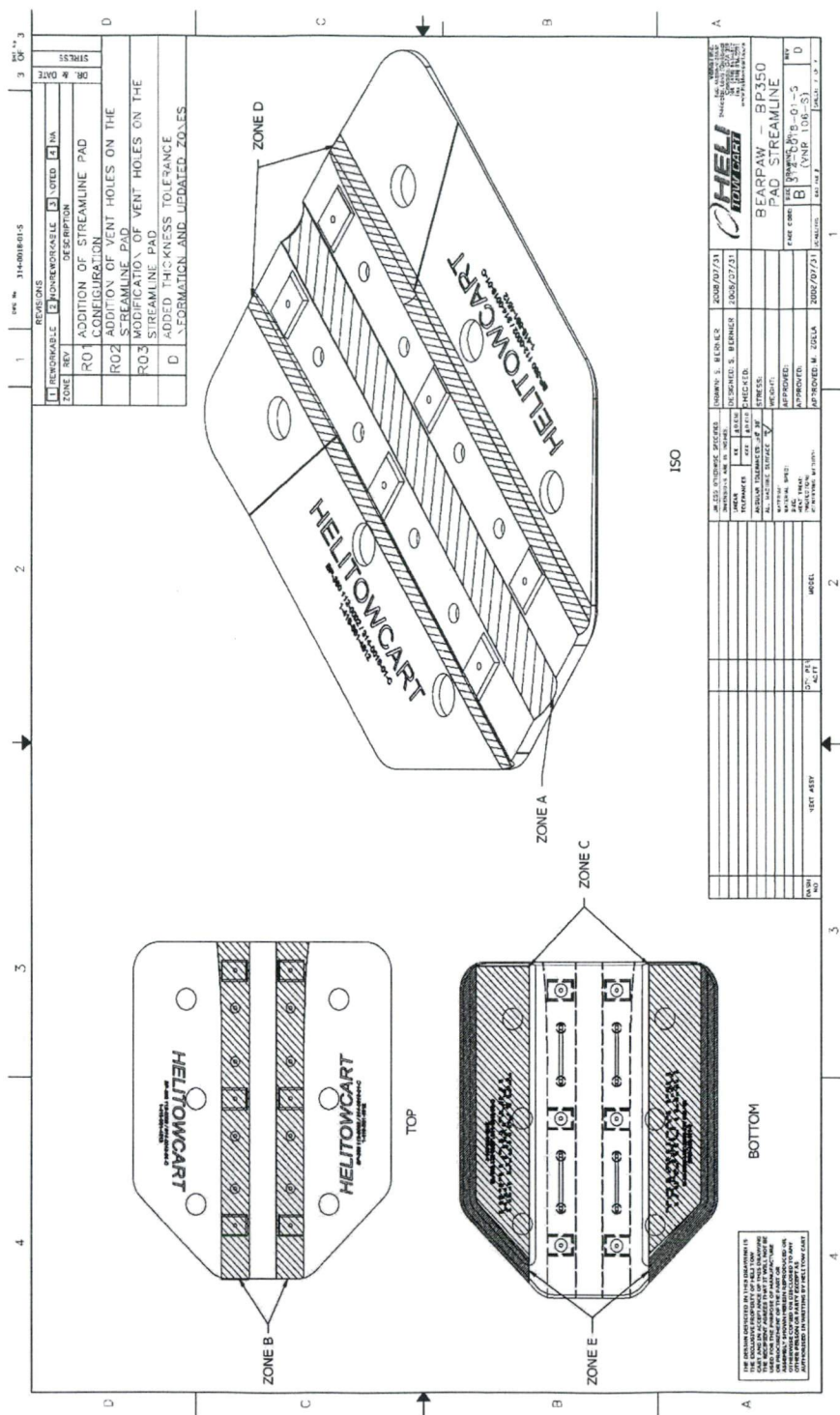
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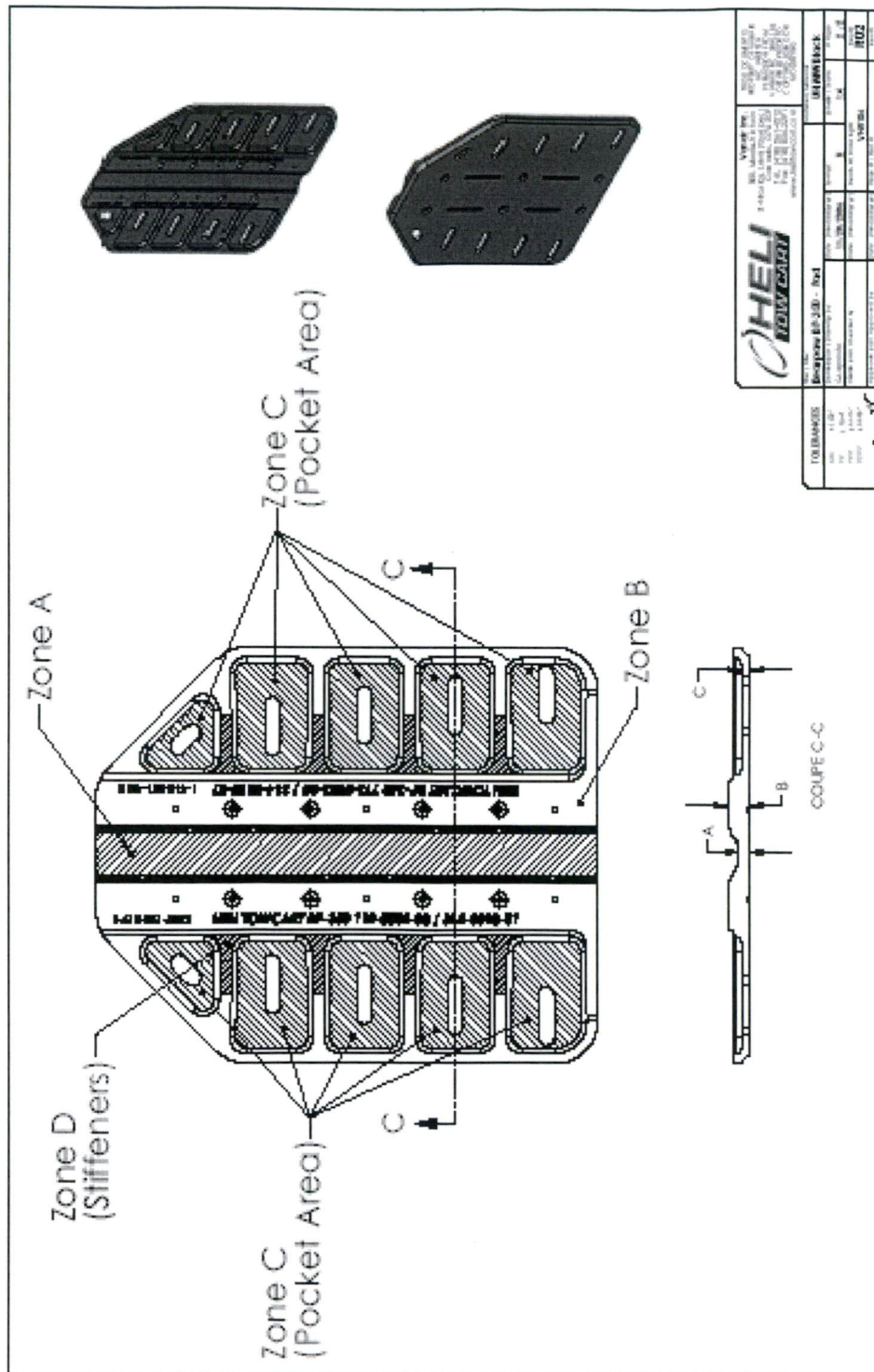
Streamline Pad with Recesses – Dwg 314-0018-01 (VNR106-S) Rev E



Streamline Pad w/o Recesses – Dwg 314-0018-01 (VNR106-S) Rev A to D



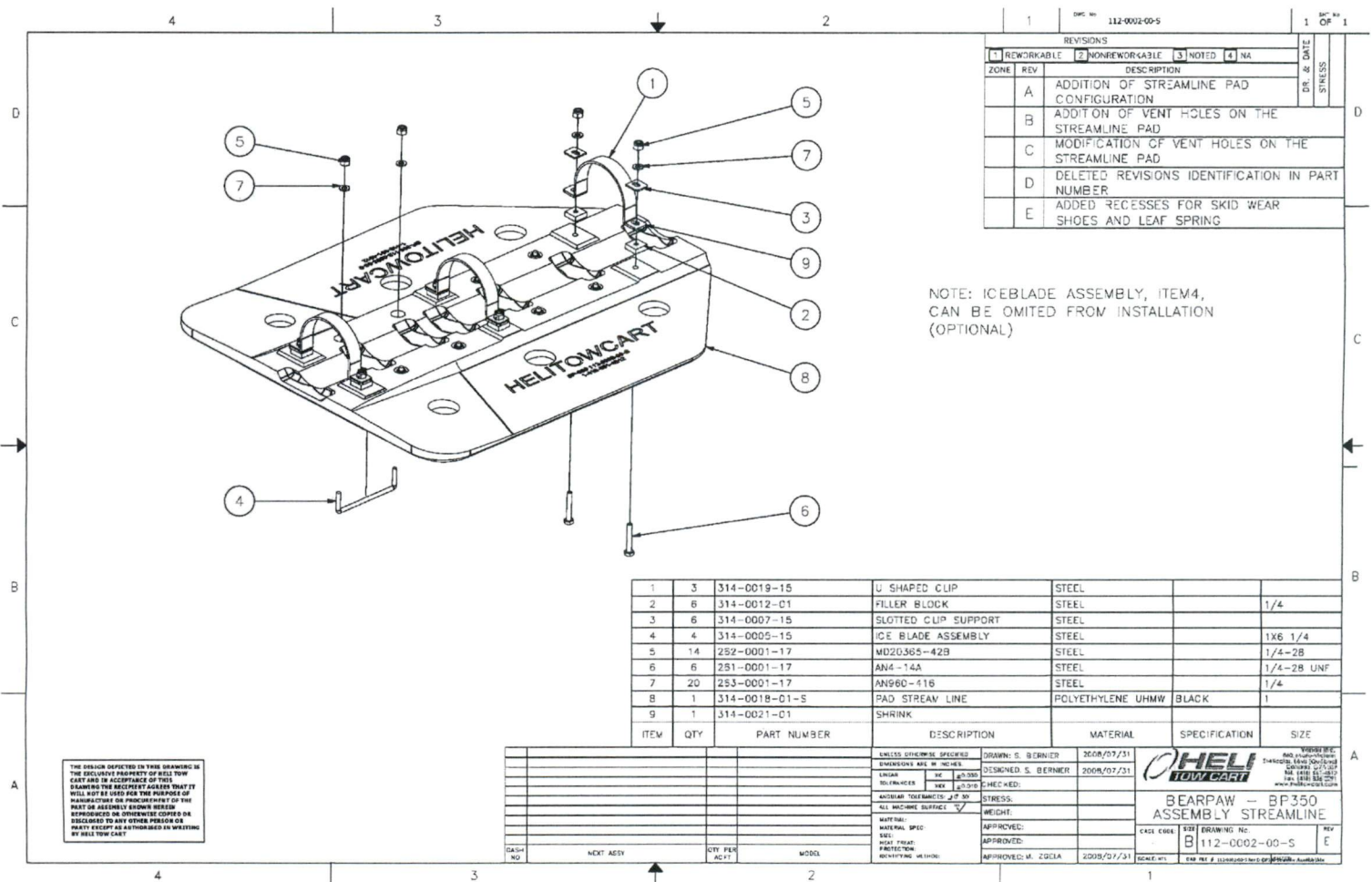
Pocket Style Pad – Dwg 314-0018-01 (VNR106) Page 2 of 2





Annex B – Tolerance Zones for Cracks and Wear

Streamline Pad – Dwg 112-0002-00-S





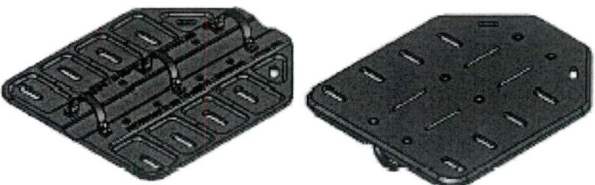
By VANAIR

Installation Instructions – AS350/355

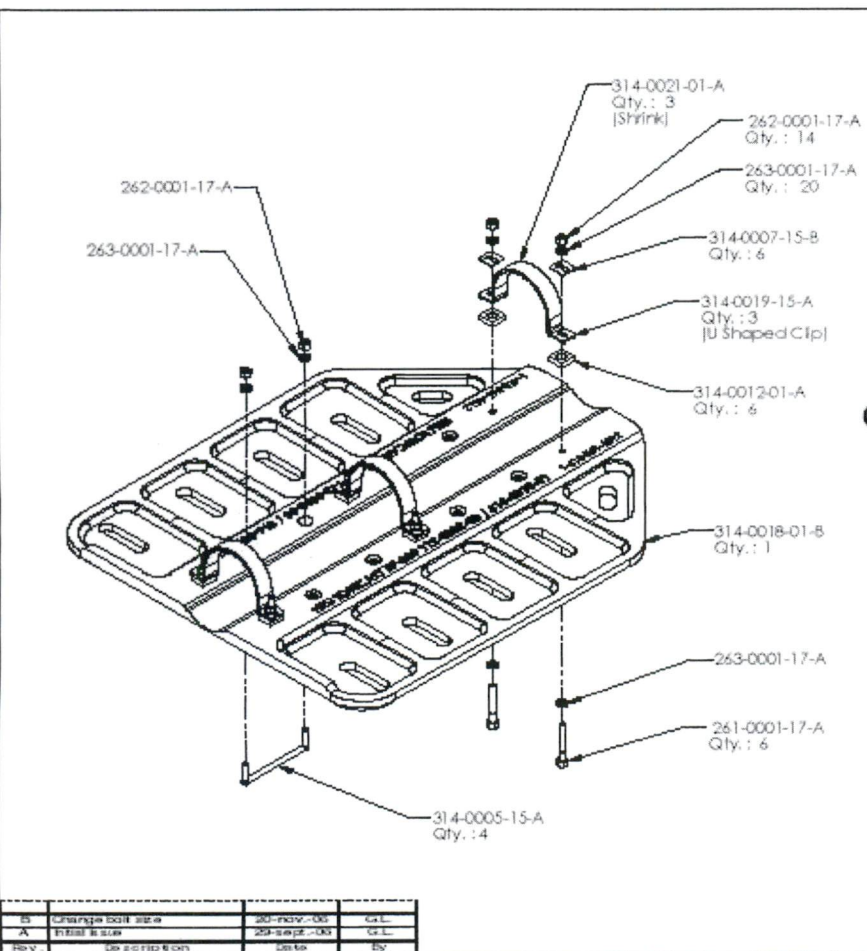
314-0020-00-E Rev. G
BearPaw Model BP350

Pocket Style Pad – Dwg 112-0002-00

No.	Qty.	Description	Part #	Rev #
1	1	Bearpaw BP-350 - Pad	314-0018-01	B
2	3	Bearpaw BP-350 - U shaped clip	314-0019-15	A
3	3	Bearpaw BP-350 - Shrink 1" x 6 1/4"	314-0021-01	A
4	6	Bearpaw - Slatted clip support	314-0007-15	B
5	6	Bearpaw - Filter Block 1/4"	314-0012-01	A
6	4	Bearpaw - Iceblade Assembly	314-0005-15	A
7	6	Bolt AN4-14A	261-0001-17	A
8	20	Washer AN960-416	263-0001-17	A
9	14	Nut MS20365-428	262-0001-17	A



Note : Iceblade assembly can be omitted from installation (Optional)



		Vanair Inc. 2600 Highway 11 Unit 100, L. 100 (2nd floor) L. 100, L. 100 (2nd floor) L. 100, L. 100 (2nd floor) L. 100, L. 100 (2nd floor) L. 100, L. 100 (2nd floor)		THIS DOCUMENT IS THE PROPERTY OF VANAIR INC. AND IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, FOR REPRODUCTION OR DISTRIBUTION.	
Bearpaw BP-350 - Assembly					
DATE OF FIRST ISSUE	11/20/2004	ISSUE	5	ISSUE DATE	11/20/2004
DATE OF LAST ISSUE	11/20/2004	ISSUE	5	ISSUE DATE	11/20/2004
112-0002-00		112-0002-00		112-0002-00	

IS	Change ball size	20-nov-05	GL
A	Initial issue	20-nov-05	GL
Rev	See also page 10	See also	By


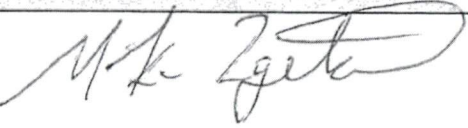
Annex A – BearPaw Assembly Drawing

REVISIONS & APPROVAL

Revisions

Date	Rev	Nature of Revisions
Nov 20, 2006	A	Initial issue
Jan 29, 2007	B	Minor editorials. Change to weight & Balance Data to reflect production model. Change in inspection schedule from 300 to 500 hours to match existing landing gear periodicity.
Feb 28, 2008	C	Introduction of new streamline BearPaw Pad configuration as alternate.
Aug 01, 2008	D	Modification of vent holes on the streamline pad
April 8, 2010	E	Correction to C of G data
December 21, 2012	F	Updated Pad Tolerances and Document identifications . Improved page set up for reader convenience.
April 29, 2016	G	Added recesses for skid wear shoes and leaf spring on streamline BearPaw and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness.

Approval

Internal Approval :		
Helitowcart inc.	 Lucien Barbeau, President	Date: May 30, 2016
External Approval :		
Transport Canada	 Mirko Zgela, DAR #310	Date: May 30, 2016

Annex A – BearPaw Assembly Drawing

See: BearPaw Assembly, dwg no. (112-0002-00) for Pocket style pad or;
BearPaw Assembly, dwg no. (112-0002-00-S) for Streamline pad

Annex B – Tolerance Zones for Cracks and Wear

See: BearPaw Pad, dwg no. 314-0018-01 (VNR106) for Pocket style pad;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev A to D for Streamline pad without recess;
BearPaw Pad, dwg no. 314-0018-01-S (VNR106-S) Rev E for Streamline pad with recesses.

Pad Recesses for Skid Wear Shoes and Leaf Spring

BearPaw 314-0018-01-S may be trimmed/machined to clear wear shoe mounting screws and skid leaf spring provided the recesses leave at least 0.500" thickness and provided that maximum lengths and widths of Figure 2 are not exceeded.

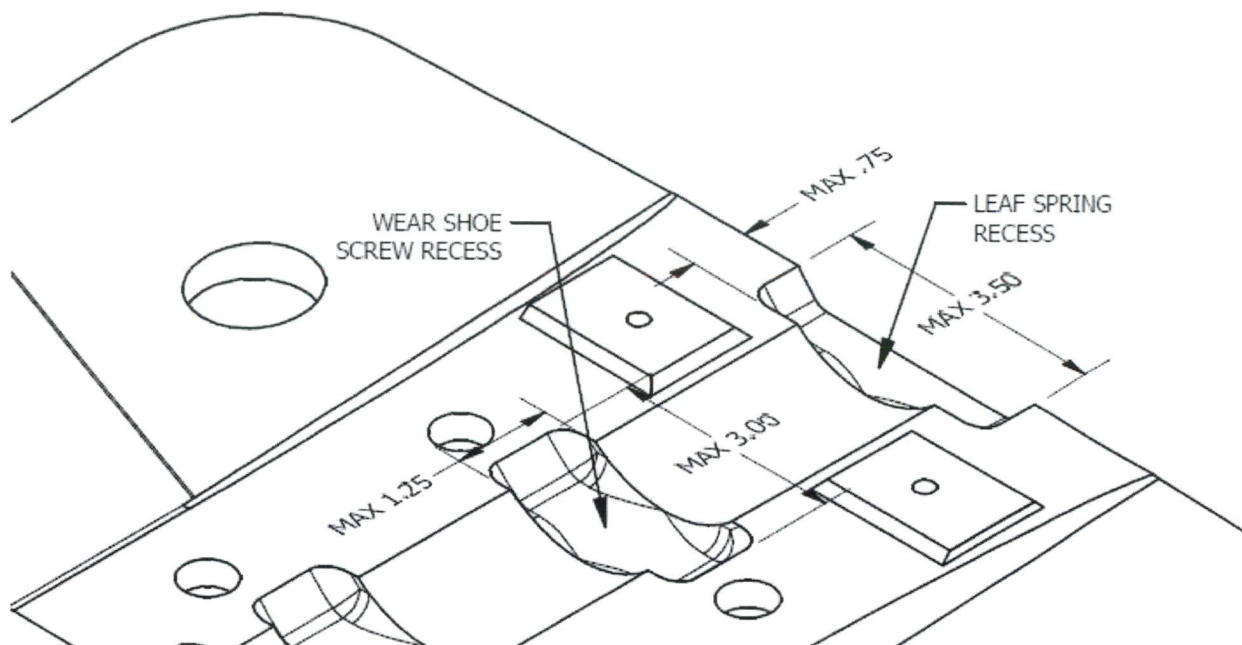


Figure 2 – Maximum Dimensions of Recesses

Overhaul Requirements

- Not applicable for the designated application of this device.

Table 5 – Tolerances for Cracks & Wear / Pocket Pad 314-0018-01 (VNR 106)

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
A	0,50	0,050	
B	1,000	0,250	
C	0,375	0,075	<u>Pockets</u> : Cracks are acceptable in the Helitowcart BearPaw pocket areas to a maximum length of 0,5" provided they are 0,25" away from the stiffener radius change. Stop drill cracks with a 0,125" hole.
D	0,50	0,050	<u>Stiffeners</u> : NO cracks in stiffeners.

Table 6 – Tolerances for Cracks & Wear / Streamline Pad 314-0018-01-S (VNR 106-S)

Zone	Nominal Dimension (Inches)	Allowable Damage/Wear (Inches)	Cracks
A	0,50	0,050	
B	1,000; and 0,88	0,250	
C	0.273 to 0,348 (variable thickness)	0,075	Cracks are acceptable in zone C under the Helitowcart BearPaw to a maximum length of 0,5". Stop drill cracks with a 0,125" hole.
D	0,49 (thickness after radius)	0,075	No cracks in the radius
E	0,38	0,075	No cracks in the BearPaw contour

INSPECTION

Life Limited Items

There are no life limited items for the Helitowcart BearPaw.

Pre-Flight

Before each flight the following items should be inspected:

- Check that attachment bolts are installed and secured,
- Check that BearPaws are free from visible damage,
- If damage is found, verify allowable damage according to Tables 5 & 6 and Annex B – Tolerances for cracks & wear

Periodic Inspection Schedule

- The Helitowcart BearPaw shall be inspected every 600 flying hours or yearly whichever comes first.
- The Helitowcart BearPaw can be inspected concurrently with the helicopter landing gear inspection.
- Recommended tolerance for performance of inspection is +/- 10% of the 600 hours period.
- Following an inspection, subsequent interval shall be adjusted to meet the original schedule from time of inspection. If inspection is performed earlier than the 10% tolerance, then following inspections shall be scheduled not to exceed the above mentioned tolerance.

600 Hours or Yearly Inspection Details

- Remove Helitowcart BearPaw: See Section "BearPaw Removal",
- Inspect all parts for damage & wear. See Tables 5 & 6 and Annex B – Tolerances for cracks & wear.
- Replace all parts damaged beyond tolerances.

Parts Lists

The Helitowcart BearPaw detailed parts list is as follows.

Table 4 – Part List (one BearPaw)

Description	Qty	Part / Dwg No.	Additional Drawing Reference No./ Name
BearPaw Assembly Model BP350	1	112-0002-00 or 112-0002-00-S	BearPaw Assembly – Pocket Style, or Bear Paw Assembly – Streamline
BearPaw Pad ⁽¹⁾ Model BP350	1	314-0018-01 or 314-0018-01-S	BearPaw BP350 – Pocket Style Pad (VNR106) or BearPaw BP350 – Streamline Pad (VNR106-S)
U Shaped Clips	3	314-0019-15	BearPaw BP350 - U Shaped Clips (VNR107)
Slotted Clip Support	6	314-0007-15	BearPaw - Slotted Clip Support (VNR089)
Filler blocks 1/4"	6	314-0012-01	BearPaw – Filler block 1/4" (VNR099)
Bolts	6	261-0001-17	Bolt- AN4-14
Nuts	6	262-0001-17	Nut- MS20365-428
Washers	12	263-0001-17	Washer – AN960-416
Shrink	3	314-0021-01	BearPaw – Shrink Specifications & Install.(1"x6.25")
IceBlade Option Model OIB	4	314-0005-15	IceBlade Assembly (VNR086)
Nuts	8	262-0001-17	Nut- MS20365-428
Washers	8	263-0001-17	Washer – AN960-416

Note (1): Use pocked shaped BearPaw Pad P/N 314-0018-01 for assembly P/N 112-0002-00. Use streamlined Pad P/N 314-0018-01-S for assembly P/N 112-0002-00-S as applicable.

BearPaw Removal

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] to allow a clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

Step 2: BearPaw Removal

- Remove nuts (P/N 262-0001-17), slotted clip support (P/N 314-0007-15) on U-shaped clips (P/N 314-0019-15),
- Remove washers (P/N 263-0001-17), U-shaped clips (P/N 314-0019-15), filler blocks (P/N 314-0012-01), and remove BearPaw pad (P/N 314-0018-01) or (P/N 314-0018-01-S Streamline);
- Inspect skid tubes to confirm serviceability
- If the skid tube shoes have been removed, re-install shoes as per reference [1];
- Complete installation by putting helicopter back to normal position by removing lift status;
- Amend Weight & Balance records as required using data provided in Table 3.

Weight & Balance

The following information should be used to amend the helicopter weight and balance information following the installation or removal:

Table 3 – Weight & Balance Data ⁽¹⁾

Item	Weight	Lateral		Longitudinal	
		Arm	Moment	Arm	Moment
Helitowcart BearPaw Model BP350 (P/N 112-0002-00)	19,9 Lb 9,0 Kg	N/A	N/A	159,4 in. 404.9 cm	3172.0 in-lb 36.44 m-kG
Helitowcart BearPaw Model BP350 - <u>Streamline</u> (P/N 112-0002-00-S)	18,3 Lb 8,5 Kg	N/A	N/A	159,4 in. 404.9 cm	2917.0 in-lb 34.41 m-kG

Notes:

(1) Weight and moment provided are for full kit installation (two BearPaw assemblies).

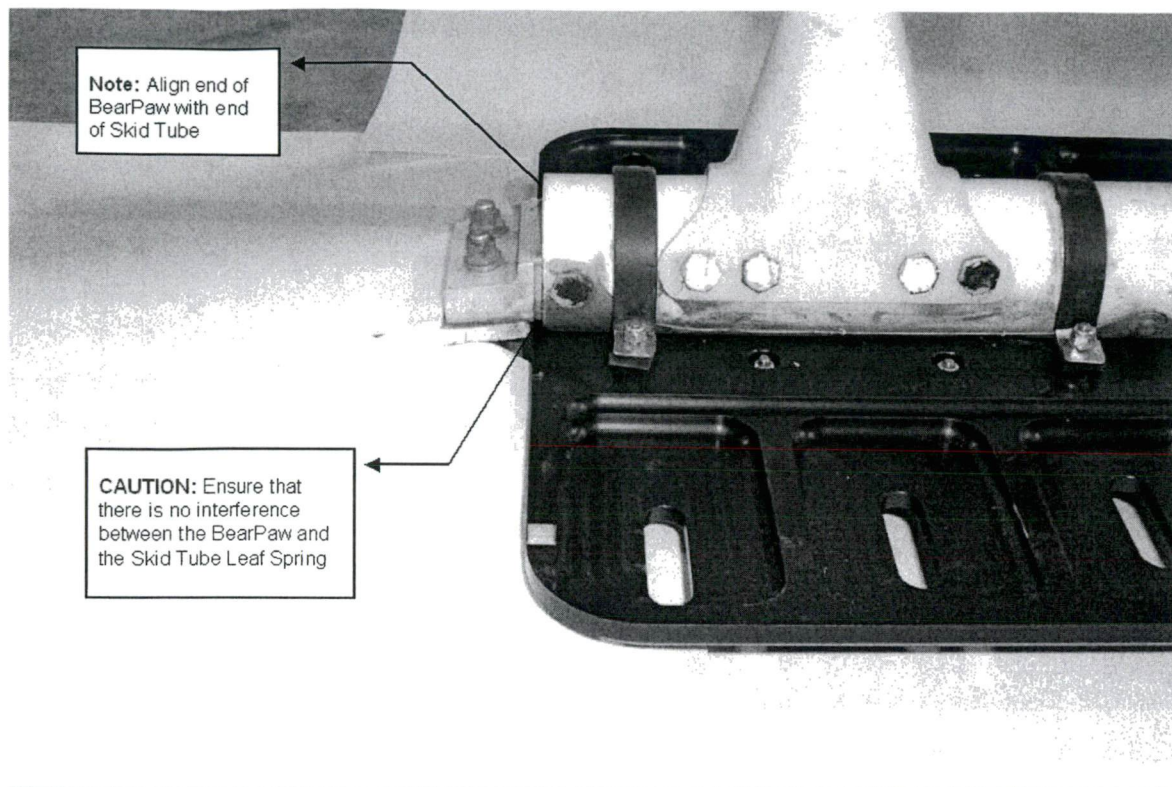


Figure 1 – BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) - Alignment on Skid

INSTALLATION**BearPaw Installation**

Reference Documentation:

[1] Helicopter Maintenance Manual AS 350 or AS 355 as applicable.

Step 1: Helicopter Preparation

- Ensure the helicopter is safe for maintenance;
- Lift the helicopter using the manufacturer recommended practice provided in Ref [1] as applicable to your helicopter model to allow a ground clearance of the skid in the area of the aft cross tube of approximately 1 ½" (38mm);

Note: The BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) can be installed with or without the skid tube wear shoes.

Step 2: IceBlade Installation

Note: The BearPaw Model BP350 (P/N 112-0002-00 or P/N 112-0002-00-S) can be installed with or without the IceBlades

- With IceBlade Option
- Install ice blades (Qty: 4) (Iceblades P/N 314-0005-15) under BearPaw pad as per drawing (112-0002-00 or 112-0002-00-S) provided at Annex A.
- Secure ice blades with washer (Washer P/N 263-0001-17) and nut (P/N 262-0001-17).

Step 3: BearPaw Installation

- Position the BearPaw under the skid as shown in Figure 1 with narrow edge pointing forward.
- Insert washers (P/N 263-0001-17) through all six bolts: 6x(261-0001-17);
- Insert bolts (P/N 261-0001-17) and washer (Washer P/N 263-0001-17) through BearPaw pad as per drawing (112-0002-00 or 112-0002-00-S) provided at Annex A;
- Insert filler blocks (P/N314-0012-01) as per drawing (112-0002-00 or 112-0002-00-S) provided at Annex A;

Note: The use of filler blocks (P/N314-0012-01) may be replaced or complemented by the use of washers (P/N 263-0001-17) to fill in the gap. Bolts (P/N 261-0001-17) may be replaced by longer or shorter AN4 bolts as required.

- Insert both U-shaped clips (P/N 314-0019-15) through bolts: 6x(261-0001-17);
- Insert slotted clip supports (P/N 314-0007-15) through all six bolts. Position slotted clip supports with rounded edge toward helicopter skid;
- Insert washer (P/N 263-0001-17) & screw nuts (P/N 262-0001-17) for a tight fit. Max. torque on nuts 60 in.-lb;
- Remove helicopter from lift;
- Amend Weight & Balance records as required using data provided in Table 3.

Installer Responsibilities

The installer shall ensure that the installation of the Helitowcart BearPaw does not conflict with any other part of the helicopter configuration. Technicians performing this installation should be familiar with A/C work and should have been familiarized with the different Helitowcart BearPaw system components prior to performing a first time installation. All steps in this procedure must be followed. Deviations from the procedures may result in potential structural failure or equipment malfunction and will result in a non-compliant installation.

INTRODUCTION

Scope

This installation instruction describes the step-by-step approach to install and to perform maintenance of the Helitowcart BearPaw Model BP 350 (P/N 112-0002-00 or P/N 112-0002-00-S) for the AS 350 and AS 355 series helicopters.

General

The Helitowcart BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance when installed on your helicopter. Any question regarding the Helitowcart BearPaw system shall be directed to Helitowcart Customer Support as indicated in Table (1):

Table 1 – Helitowcart Customer Support

Care of	Mailing Address	Phone, Fax & Email:
Customer Support Helitowcart BearPaw Helitowcart (Vanair inc)	860 Marie-Victorin St-Nicholas, Levis, Quebec, Canada, G7A 3S9	Tel:1 (418) 561-4512 Fax:1 (418) 836-4575 info@helitowcart.com

Helicopter Effectivity

This installation instruction applies to the following helicopter models:

Table 2 – Helicopter Model Effectivity

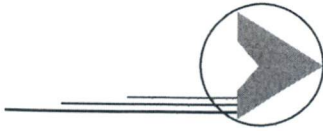
Make	Model	Transport Canada Type Certificate Data Sheet
Eurocopter	AS 350 D	H-83
Eurocopter	AS 350 D1	
Eurocopter	AS 350 B	
Eurocopter	AS 350 B1	
Eurocopter	AS 350 B2	
Eurocopter	AS 350 B3	
Eurocopter	AS 350 BA	
Eurocopter	AS 355 E	H-87
Eurocopter	AS 355 F	
Eurocopter	AS 355 F1	
Eurocopter	AS 355 F2	
Eurocopter	AS 355 N	

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Sathia Rautan 2016 06 27

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Aviatech Technical Services Inc.

3005 rue Lindbergh
Trois-Rivières, Québec
G9A 5E1

F_{vm} = Von Mises maximum stress = 4435 psi

$MS = 0.1$

Conclusion:

The new BearPaw Pad is indeed structurally acceptable since the margin of safety (MS) is superior to "0".

Installation Instructions:

1	Refer to document 314-0020-00 Rev E, BearPaw Model BP350 – Installation Instructions - AS350/355 Series Helicopter, dated Apr 08, 20
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3005 rue Lindbergh
Trois-Rivières, Québec
G9A 5E1

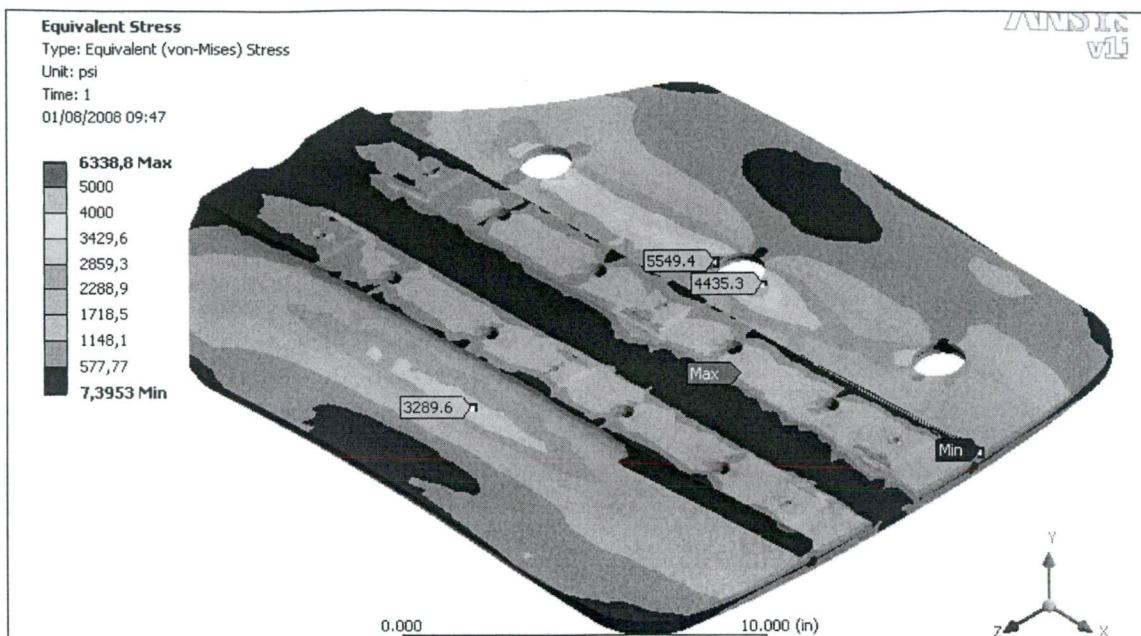


Figure 4 - BearPaw – Pad Streamline Von Mises Stress

The model shows that the Von Mises stress is 5549 Psi near the holes. But 5549 psi is not the reality since the value is located on a edge, if we take a closer look at the hole stress, see Figure 5, the stress is indeed lower 4435 psi.

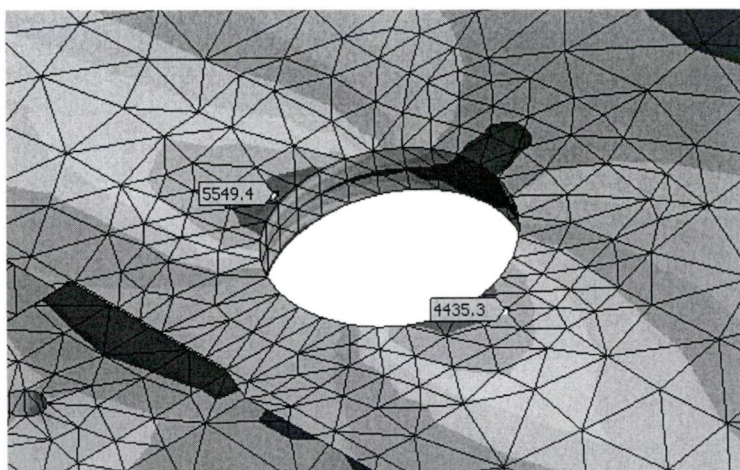


Figure 5 - BearPaw – Pad Streamline Holes Von Mises Stress

As such we have the margin of safety:

$$MS = (F_{tu} / (FS \times F_{vm})) - 1$$

Where;

F_{tu} = Material ultimate tensile strength = 6800 psi¹

FS = Factor to ultimate load = 1.5

¹ From 314-0008-01-A, Propriétés de l'UHMW TIVAR, dated May 25, 2006

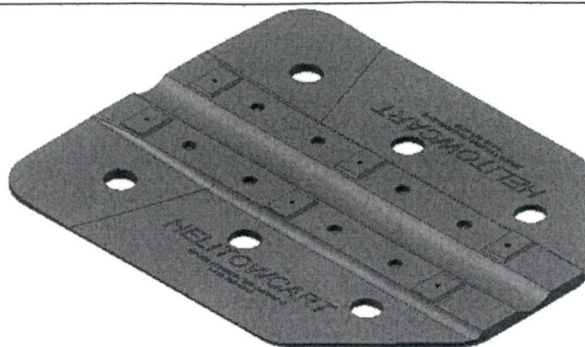
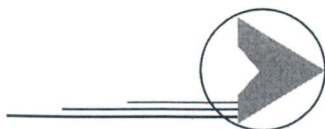


Figure 2 - BearPaw BP350 – Pad Streamline

Structural Analysis:

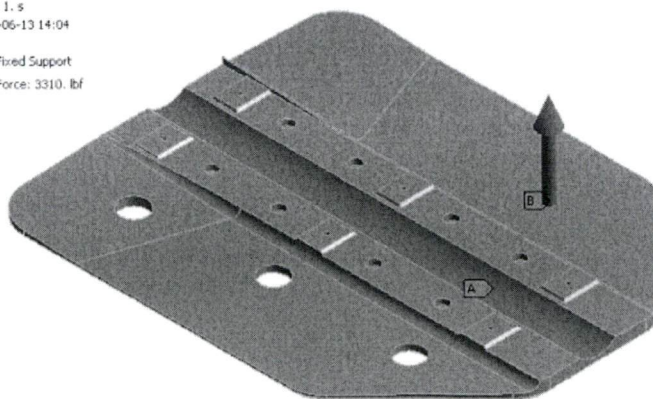
The critical load case is taken from report AAC-STR-BP-AS350/355-1000. Since there are no other parts change in the assembly only the BearPaw Pad needs a new analysis. The analysis is made with Ansys 11.0 Workbench finite element model (FEM) software. Since the attachment hole geometry has not changed the bearing load will not be calculated.

The load (B) of 3310 lbs in the (Y) direction corresponds to the weight of the helicopter equally distributed under the BearPaw. The fixed support (A) Restrain the pad in the six degrees of freedoms. Figure 3 shows the loading condition. The model shows hole on one side only in order to compare the impact of those holes on the stress.

Static Structural
Time: 1. s
2011-06-13 14:04

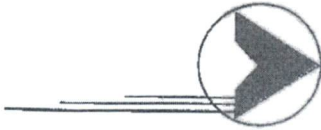
A Fixed Support
B Force: 3310. lbf

ANSYS
v11



0.000 10.000 (in)
mm

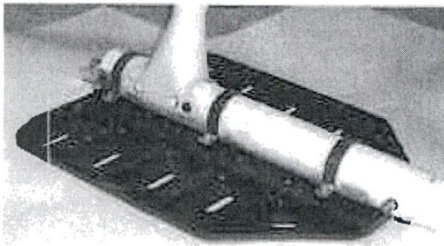
Figure 3 - BearPaw – Pad Streamline FEM Model



Aviatech Technical Services Inc.

3005 rue Lindbergh
Trois-Rivières, Québec
G9A 5E1

Technical Memorandum

Title: Structural Substantiation - BearPaw Streamline BP350				TM# HTC-MEM-0709-001 Rev_A	
Prepared by: Simon Bernier	Design: Simon Bernier	Mech: N/A	Stress: Simon Bernier	Approved: Mirko Zgela (DAR #310)	Date: July 31, 2008
A/C Effectivity		Registration: N/A		Serial#: N/A	
Reference Documents:					
<p>[1] 314-0020-00 Rev E, BearPaw Model BP350 – Installation Instructions - AS350/355 Series Helicopter, dated Apr 08, 2010</p> <p>[2] AAC-STR-BP-AS350/355-1000, Structural Substantiation – Helitowcart (Vanair Inc.) BearPaw Model BP350, dated Nov 20, 2006</p> <p>[3] 314-0008-01-A, Propriétés de l'UHMW TIVAR, dated May 25, 2006</p>					
Applicable Drawings:					
<p>[1] 112-0002-00-S Rev C, BearPaw BP350 - Assembly Streamline, dated Jul 31, 2008</p> <p>[2] VNR106 Rev 02, BearPaw BP350 – Pad Streamline, dated Jul 31, 2008</p>					
<p>Background: The Helitowcart BearPaw is made of machined UHMW TIVAR® polymer sheet. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability will provide superior performance to your Eurocopter helicopter.</p> <p>Description of Change: The new Bearpaw Pad (P/N 314-0018-01 (VNR106-S)) has a new profile is made to ensure that no rocks will get in to the top pocket. Figure 1 shows the original pad (P/N 314-0001-01).</p>					
					
<p>Figure 1 - BearPaw 350 – Pad</p>					
<p>New configuration: Figure 2 shows the new Bearpaw Pad Streamline (P/N VNR106-S).</p>					

2016 06 22



BearPaw Model BP350

Rework Instructions:	
1	Drill the hole pattern as per drawing #VNR106-S, BearPaw BP350 Pad Streamline, Rev R03, dated July 31, 2008



BearPaw Model BP350

Engineering Order

Title: Bear Paw Model BP350 Vent Holes				EO#: HTS-EO-0709-002 Rev A	
Prepared by: Simon Bernier	Design: N/A	Mech: N/A	Stress: N/A	Approved: Mirko Zgela (DAR #310)	Date: July 31, 2008
A/C Effectivity:		AS 350 D, B, B1, B2, B3 & BA AS 355			
Reference Documents:					
[a]	Drawings: #112-0002-00, BearPaw BP350 – Assembly, Rev C, dated July 31, 2008				
[b]	#VNR106-S, BearPaw BP350 Pad Streamline, Rev R03, dated July 31, 2008				
[c]	# HTC-MEM-0709-001, Memorandum – Vent Holes BP350 BearPaw, Rev A, dated July 31, 2008				
Reason for change: To reduce the possibility for the BearPaw to stick to the ground while performing landing & take off on muddy terrain.					
Description of change: To create a continuous path for the air, a number of holes are drilled into the Bear Paw pads.					
Previous Configuration: The old configuration was as per drawing #VNR106-S, BearPaw BP350 Pad Streamline, Rev A, dated Feb 29, 2008					
New Configuration: The new configuration of Bear Paw is as per drawing #VNR106-S, BearPaw BP350 Pad Streamline, Rev R03, dated July 31, 2008.					
Structural substantiation: The introduction of the vent holes has a negligible effect on the strength of the BearPaw and is documented in the following memorandum # HTC-MEM-0709-001, Memorandum – Vent Holes BP350 BearPaw, Rev A, dated July 31, 2008					

Nathaniel Barbeau
2008 06 22

		Compliance				
27.337	Limit Maneuvering Load Factor	Analysis	AAC-STR-AS350/355-1000, Rev NC dated Nov 20, 2006		DAR 310	(1)
27.501	Ground Loads Conditions – Landing Gear with Skids	Analysis	AAC-STR-AS350/355-1000, Rev NC dated Nov 20, 2006	A suitable set of design loads have been derived for the BearPaw.	DAR 310	(1)
	Subpart D Design & Construction					
27.603	Material	Engineer Document	AAC-STR-AS350/355-1000, Rev NC dated Nov 20, 2006	The BearPaw material used is widely used in the industry and has well defined properties.	DAR 310	(1)
27.605	Fabrication Methods	Statement		The BearPaw are fabricated using standard machining technique.	DAR 310	(1)
27.607	Fasteners	Design	Drawing 112-0002-00 RB, dated Nov 20, 2006	Only aerospace fasteners have been used.		
27.609	Protection of structure	Statement		The BearPaw material used is highly durable and cannot corrode.	DAR 310	(1)
27.611	Inspection provisions	Engineering Document	HTC-314-0020-00-A Rev A, dated Nov 20, 2006	The BearPaw Installation Instruction provides all the necessary provisions for inspection and continuous airworthiness. .	DAR 310	(1)
27.619	Special Factor	N/A				
27.621	Casting Factor	N/A				
27.623	Bearing Factor	N/A				
27.625	Fitting Factor	N/A				
27.629	Flutter	Test	FTR – C-GZCN dated Aug 21, 2006		DAR 310	(1)

Note (1): Compliance signature provided in DAR #310, Project# 2006-08 AE-100/01

2.0 COMPLIANCE STATEMENTS

Requirement	Title/Content	Compliance		Comments	Approval by	Signature
		Method	Document #			
AWM 527	Subpart A Airworthiness Requirements					
27.2	Special retroactive requirements	N/A		This modification has no impact on the special retroactive requirements	DAR 310	(1)
	Subpart B Flight Requirements					
27.29	Empty weight and corresponding center of gravity	Engineering Document	HTC-314-0020-00-A Rev A, dated Nov 20, 2006	A W&B information is provided in the Installation Instructions	DAR 310	(1)
27.251	Vibration	Test	FTR – C-GZCN dated Aug 21, 2006		DAR 310	(1)
	Subpart C Strength Requirement					
27.301	Flight Loads	Analysis	AAC-STR-AS350/355-1000, Rev NC dated Nov 20, 2006		DAR 310	(1)
27.303	Factor of Safety	Analysis	AAC-STR-AS350/355-1000, Rev NC dated Nov 20, 2006		DAR 310	(1)
27.305	Strength & Deformation	Analysis	AAC-STR-AS350/355-1000, Rev NC dated Nov 20, 2006	The analysis has shown that the BearPaw strength and deformation are deemed acceptable.	DAR 310	(1)
27.307	Proof of Structure	Analysis	AAC-STR-AS350/355-1000, Rev NC dated Nov 20, 2006		DAR 310	(1)
27.309	Design Limitations (c) & (d)	Test	FTR – C-GZCN dated Aug 21, 2006		DAR 310	(1)
27.321	General	Analysis	AAC-STR-BP-R44-1000, Rev NC dated July 4, 2006		DAR 310	(1)

1.4 Effect of Changes

The BearPaw will have a negligible effect the aircraft performance. The installation instructions provided with each installation kit gives Weight and Balance information pertinent to the modification.

1.5 Affected Registration and Serial

This modification is to be installed on any of the following AS350 or AS355 Series Helicopters:

Make	Model	Type Certificate Data Sheet
Eurocopter	AS 350 D	H-83
Eurocopter	AS 350 D1	H-83
Eurocopter	AS 350 B	H-83
Eurocopter	AS 350 B1	H-83
Eurocopter	AS 350 B2	H-83
Eurocopter	AS 350 B3	H-83
Eurocopter	AS 350 BA	H-83
Eurocopter	AS 355 E	H-87
Eurocopter	AS 355 F	H-87
Eurocopter	AS 355 F1	H-87
Eurocopter	AS 355 F2	H-87
Eurocopter	AS 355 N	H-87

1.0 INTRODUCTION

1.1 Purpose

This compliance plan establishes for the Eurocopter AS350 and AS355 series helicopters the methods by which Aviatech Airworthiness Consultants proposes to show compliance for the installation of the Helitowcart BearPaw Model BP350.

1.2 Basis of Certifications

The applicant has elected to use the latest amendments to the airworthiness requirements AWM 527.

1.3 Description of the Modification

The Helitowcart BearPaws are made of machined UHMW TIVAR® polymer 1.0 in. sheet material. This material combines high-impact performance, low friction and good resistance to chemical. Its high durability provides superior performance. The UHMW Polymer has a lower coefficient of friction than glass. Together with its self lubricating characteristics is an ideal material for this design application where sliding contact is encountered.

The machined BearPaw is attached to the R/H and L/H helicopter aft skid tubes where the aft cross tube attaches. The BearPaw is attached to the skids using three stainless steel bands and six AN-4 bolts. The BearPaw pad has a machined recess on its centerline that perfectly matches the cross tube contour providing a smooth skid bearing loads. The total weight of the installation is less than 21 lbs. A typical BearPaw Model BP350 installation on an AS 350 helicopter is shown in Figure (1).

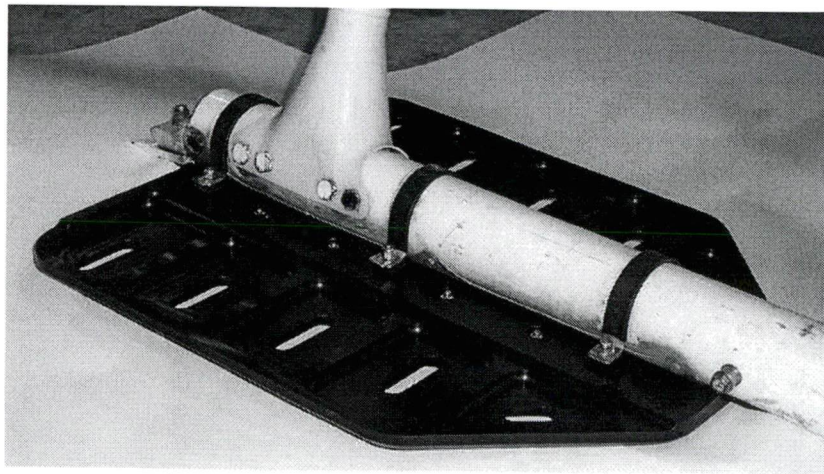


Figure (1) – Installation of BearPaw Model PB350 on AS 350 Helicopter Skid

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1.4 EFFECT OF CHANGES	3
1.5 AFFECTED REGISTRATION AND SERIAL.....	3
2.0 COMPLIANCE STATEMENTS	4

List of Figures

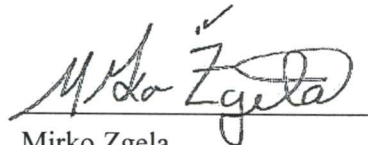
Figure (1) – Installation of BearPaw Model PB350 on AS 350 Helicopter Skid

Aviatech Airworthiness Consultants

4100 Renoir
Trois-Rivières, (QC)
G8Y 6Y6

Aviatech Airworthiness Consultants**Compliance Plan****Eurocopter Model AS350/355 Series Helicopters
Installation of BearPaw Model BP350****Report: HTC-CPL-BP-AS350/355-1000 (Rev NC)**

APPROVED BY:



Mirko Zgela
Design Approval Representative

DATE: Nov 22, 2006

DAR #310

Revision	Revision Date	Revision of Entry	Entered by

3.0 REFERENCE DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
314-0009-01	Ultra High Molecular Weight Polyethylene – Typical Properties	A	N/A	May 24, 2006
314-0008-01	Material Properties - UHMW TIVAR	A	N/A	May 24, 2006
314-0017-05	Heat Shrink Specifications	A	N/A	Sept 6, 2006



1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
✓ AAC-CPL-BP-AS350/355/EC130-1000*	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	B	DAR 310	May 11, 2011
✓ HTC-314-0020-00-E	BearPaw Model BP350 – Installation Instruction – AS350/355 Series Helicopters	G	DAR 310	May 30, 2016
AAC-STR-BP-AS350/355-1000*	Structural Substantiation – Helitowcart Inc. BearPaw Model BP350	NC	DAR 310	Nov 20, 2006
AAC-FTR-C-GZNC*	Simple External Modification – Applicant's Flight Test Plan/Report	NC	DAR 310	Nov 21, 2006
✓ HTS-EO-0709-002	Bear Paw Model BP350 Vent Holes	A	DAR 310	July 31, 2008
✓ HTC-MEM-0709-001	Memorandum – Vent Hole BP350 BearPaw	A	DAR 310	July 31, 2008
HTC-TM-0709-001*	Structural Substantiation – BearPaw Streamline BP350 with Recesses Wear Pads	NC	DAR 310	May 30, 2016

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
112-0002-00	BearPaw BP350 - Assembly	B	DAR 310	Nov 20, 2006
112-0002-00-S	BearPaw BP350 – Assembly Streamline	E	DAR 310	May 30, 2016
314-0002-15 (VNR084)	BearPaw – Iceblade	A (R01)	DAR 310	Aug 9, 2013 Apr 24, 2006
314-0004-15 (VNR085)	BearPaw – Iceblade Threaded Rod	A (R01)	DAR 310	Aug 9, 2013 Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Aug 9, 2013 Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0012-01 (VNR099)	Filler Block 1/4"	A (R01)	DAR 310	Aug 9, 2013 Aug 8, 2006
314-0018-01 (VNR106)	BearPaw BP350 - Pad	B (R02)	DAR 310	Sept 26, 2006
314-0018-01-S (VNR106-S)	BearPaw BP350 – Pad Streamline	E	DAR 310	May 30, 2016
314-0019-15 (VNR107)	BearPaw BP350 – U Shaped Clip	A (R01)	DAR 310	Sept 29, 2006

Now Revision B
2017-03-29 (mpc)

Page 2/3

* in the hands of Mike Zeck only.
d TC

DOCUMENTS CLASSÉS
SELON ORDRE D'APRÈS HDL *

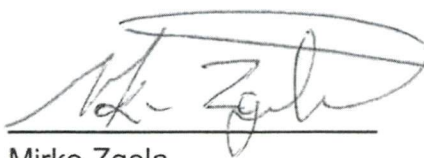
Master Document List

Helitowcart

Eurocopter Model AS 350/355 Series Helicopters Installation of BearPaw Model BP350

Report: HTC-MDL-BP-AS350/355-1000 (Rev H)

APPROVED BY:



DATE: MAY 30, 2016

Mirko Zgela

Design Approval Representative DAR #310

Revision	Revision Date	Revision of Entry	Entered by
A	Nov 22, 2006	Initial issue	N/A
B	Jan 28, 2007	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
C	Feb 28, 2007	Addition of streamline pad configuration. Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
D	July 27, 2008	Addition of vents holes in the streamline pad.	M.Z.
E	Aug 01, 2008	Modification of vents holes in the streamline pad.	M.Z.
F	April 8, 2010	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
G	December 21, 2012	Updated Tolerance data regarding Pad and Updated referenced document identification and revisions	M.Z.
H	May 30, 2016	Added recesses for skid wear shoes and leaf spring on streamline BearPaw (Dwg # 314-0018-01-S) and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness.	M.Z.



Page 1/3

1- Install Shrink:

- Prepare Heat Shrink:

BP44 & BP66:

Use 1.5" wide shrink. Cut to 5.5" length.

BP350 & BP130:

Use 1.5" wide shrink. Cut to 6.75" length.

- Insert U clips into shrink.
- Set U clips standing or on their side on aluminum sheet on cookie pan.
- Heat in oven at 350F for approx. 5 minutes or until shrink is tightly resting against stainless steel on its whole surface.

Nature modifications: Complete update of instruction



P. Parlee 2017 06 01

instr.


EURO

FAA APPROVED MODEL LIST (AML) NO. SR02432NY
 HELITOWCART (VANAIR, INC.)
 FOR
 INSTALLATION OF BEAR PAWS

Original Issue Date: July 20, 2007
 Amended Date: June 3, 2014

PART	REGULATION	MAKE	MODEL	TCDS	REQUIRED DOCUMENTATION			AML AMENDMENT DATE
					MASTER DOCUMENT LIST	INSTALLATION INSTRUCTIONS	INSTRUCTIONS for CONTINUED AIRWORTHINESS	
27	Federal Aviation	Robinson Helicopter Company	R66	R00015LA	Helitowcart Inc. Master Document List, Report no. HTC-MDL-BP- R44-1000 Rev. D, approved on August 28, 2013 or later Transport Canada approved revision.	Helitowcart Inc. Installation Instructions - R44/R66, Bear Paw Model BP44, document no. 314-0011-00, Rev. E, approved on August 9, 2013 or later Transport Canada approved revision.	Contained within Installation Instructions, page 6 of document no. 314- 0011-00, Rev. E.	June 3, 2014

FAA Approved: 

 Gaetano Sciortino
 Manager, New York
 Aircraft Certification Office

FAA APPROVED MODEL LIST (AML) NO. SR02432NY
HELITOWCART (VANAIR, INC.)
FOR
INSTALLATION OF BEAR PAWS

Original Issue Date: July 20, 2007
Amended Date: June 3, 2014

PART	REGULATION	MAKE	MODEL	TCDS	REQUIRED DOCUMENTATION			AML AMENDMENT DATE
					MASTER DOCUMENT LIST	INSTALLATION INSTRUCTIONS	INSTRUCTIONS for CONTINUED AIRWORTHINESS	
27	Federal Aviation	Airbus Helicopters	AS350B, B1, B2, B3, BA, D, D1	H9EU	Helitowcart Inc. Master Document List, Report no. HTC-MDL-BP- AS350/355-1000 Rev. G, approved on December 21, 2012 or later Transport Canada approved revision.	Helitowcart Inc. Installation Instructions - AS350/355, Bear Paw Model BP350, document no. 314-0020-00-E, Rev. F, approved on December 21, 2012 or later Transport Canada approved revision.	Contained within Installation Instructions, page 8 of document no. 314- 0200-00-E, Revision F.	June 3, 2014
27	Federal Aviation	Airbus Helicopters	EC 130B4	H9EU	Helitowcart Inc. Master Document List, Report no. HTC-MDL-BP- EC130-1000 Rev A, approved on May 13, 2011 or later Transport Canada approved revision.	Helitowcart Inc. Installation Instructions - EC130, Bear Paw Model BP130, document no. 314- 0031-00-A, Rev. A, approved May 4, 2011 or later Transport Canada approved revision	Contained within Installation Instructions, page 6 of document no. 314- 0031-00-A, Revision A.	June 3, 2014
27	Federal Aviation	Airbus Helicopters	AS355E, F, F1, F2, N	H11EU	Helitowcart Inc. Master Document List, Report no. HTC-MDL-BP- AS350/355-1000 Rev. G, approved on December 21, 2012 or later Transport Canada approved revision.	Helitowcart Inc. Installation Instructions - AS350/355, Bear Paw Model BP350, document no. 314-0020-00-E, Rev. F, approved on December 21, 2012 or later Transport Canada approved revision.	Contained within Installation Instructions, page 8 of document no. 314- 0200-00-E, Revision F.	June 3, 2014
27	Federal Aviation	Robinson Helicopter Company	R44, R44 II	H11NM	Helitowcart Inc. Master Document List, Report no. HTC-MDL-BP- R44-1000 Rev. D, approved on August 28, 2013 or later Transport Canada approved revision.	Helitowcart Inc. Installation Instructions - R44/R66, Bear Paw Model BP44, document no. 314-0011-00, Rev. E, approved on August 9, 2013 or later Transport Canada approved revision.	Contained within Installation Instructions, page 6 of document no. 314- 0011-00, Rev. E.	June 3, 2014

NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590

**INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT**

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.

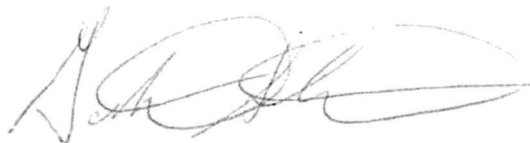
If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR 21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.



Gaetano Sciortino
Manager
New York Aircraft Certification Office

United States of America
Department of Transportation -- Federal Aviation Administration

Supplemental Type Certificate
IMPORT

Number SR02432NY

This certificate issued to

Helitowcart (Vanair Inc.)
877A, Alphonse-Desrochers
Saint-Nicholas, Lévis, Québec
Canada G7A 5K6

certifies that the change in the type design for the following product with the limitations and conditions therefor as specified herein meets the airworthiness requirements of * of the * Regulations.

Original Product -- Type Certificate Number: *

Make: *

Model: *

* See attached FAA Approved Model List (AML) No. SR02432NY for the list of approved aircraft models, applicable airworthiness regulations, and required documents.

Description of Type Design Change:

1. Installation of Helitowcart Bear Paw Models BP350, BP44 or BP130 in accordance with Helitowcart Master Document Lists as specified in AML SR02432NY.
2. Instructions for Continued Airworthiness documents as specified in AML SR02432NY are required with this installation.

Limitations and Conditions:

1. A copy of this certificate and FAA AML No. SR02432NY must be maintained as part of the permanent records of this modified aircraft.
2. The Installer must determine whether this design change is compatible with previously approved modifications.
3. If the holder agrees to permit another person to use this certificate to alter a product, the holder must give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration

Date of application: March 26, 2007

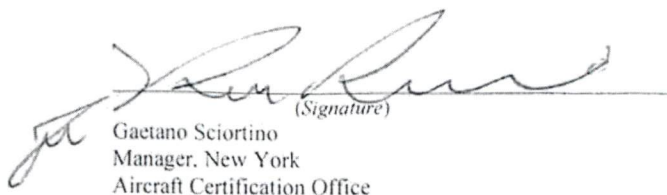
Date reissued:

Date of issuance: July 20, 2007

Date amended: January 14, 2013, June 3, 2014



By direction of the Administrator


(Signature)
Gaetano Sciortino
Manager, New York
Aircraft Certification Office

(Title)

Added BP44
for R06
original in
BP44 DMR

U.S.



NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

**Installation/Operating Data,
Required Equipment and Limitations (Cont'd):**

For the Eurocopter (formerly Aerospatiale) AS350 and AS355 Series Helicopters:

Installation of Helitowcart Bear Paw BP350 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-AS350/355-1000, Revision F dated April 8, 2010, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0020-00-E, BearPaw Model BP350, Installation Instructions - AS350/355".

For the Eurocopter EC 130 Helicopters:

Installation of Helitowcart Bear Paw BP130 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0031-00-A, BearPaw Model BP130, Installation Instructions - EC 130".

Fleet Eligibility List		
Make	Model	Type Certificate Data Sheet
Robinson	R44	H-97
Robinson	R44 II	H-97
Eurocopter	AS 350 B	H-83
Eurocopter	AS 350 B1	H-83
Eurocopter	AS 350 B2	H-83
Eurocopter	AS 350 B3	H-83
Eurocopter	AS 350 BA	H-83
Eurocopter	AS 350 D	H-83
Eurocopter	EC 130 B4	H-83
Eurocopter	AS 355 E	H-87
Eurocopter	AS 355 F	H-87
Eurocopter	AS 355 F1	H-87
Eurocopter	AS 355 F2	H-87
Eurocopter	AS 355 N	H-87

— End —



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Helitowcart Inc.
860 Marie-Victorin
St-Nicholas, Lévis, Québec
Canada G7A 3S9

Number: SH06-24

Issue No.: 3

Approval Date: August 17, 2006

Issue Date: July 7, 2011

Responsible Office:

Québec

Aircraft/Engine Type or Model:

See Continuation Sheet Page 2 of 2

Canadian Type Certificate or Equivalent:

See Continuation Sheet Page 2 of 2

Description of Type Design Change:

Installation of Helitowcart BearPaw

**Installation/Operating Data,
Required Equipment and Limitations:**

For the Robinson Models R44 and R44 II Helicopters:

Installation of Helitowcart Bear Paw BP44 is to be performed in accordance with TC approved Helitowcart Inc. Master Document List, Report: HTC-MDL-BP-R44-1000, Revision C dated April 15, 2010, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Inc. Installation Instructions Document: "HTC-314-0011-00-D, BearPaw Model BP44, Installation Instructions - R44".

See Continuation Sheet Page 2 of 2



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.


Jean-Pierre Francoeur
For Minister of Transport

Canada

Jean-François Lemire, ing.

**DIRECTEUR D'INGÉNIERIE
ENGINEERING DIRECTOR**

T: 819.601.8049 #203

jeanfrancois@ats-ast.com


Aviatech
SERVICES TECHNIQUES™
TECHNICAL SERVICES™

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Trois-Rivières, Qc, Canada
G9A 4G1

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www.ats-ast.com

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 *Studies have shown that trees live longer when they're not cut down.
Avant d'imprimer, pensez à l'environnement.*

De : Nathalie Barbeau [<mailto:1nbarbeau@gmail.com>]

Envoyé : 12 novembre 2013 14:43

À : Jean-Francois Lemire

Objet : Erreur dans le STC (encore)?

Jean-François,

Je note que le document que tu m'as fourni, intitulé « Statement of Conformity with Certification Basis », Q-SH06-24 fait la liste des MDL les plus récentes. Hors pour le AS350 les versions sur ton document et sur le STC ne matchent pas.

Le STC semble ne pas avoir été modifié correctement.

La version que j'ai reçu est-elle avant correction?

J'espérais avoir enfin éliminé toutes les erreurs de nos documents mais si on doit vivre avec c'est ok pour moi si la suite du texte « or later Transport canada approved revision », fait en sorte que nous sommes conformes par la bande.

Ceci m'amène à te poser la question suivante : Quand c'est écrit « or later Transport canada approved revision » comment je fais pour savoir si TC a réellement approuvé? Est-ce la signature de Mirko qui fait foi de TC en tant que DAR?

Je te pose la question car je ne sais pas comment je répondrais à un auditeur justement dans le cas mentionné ci-haut car ma version de MDL est effectivement plus récente que celle mentionnée and le STC que je viens de recevoir.

J'attends de tes nouvelles pour m'éclairer!

Nathalie Barbeau

From: Jean-Francois Lemire [jeanfrancoisl@ats-ast.com]
Sent: November-13-13 2:15 PM
To: nbarbeau@helitowcart.com
Subject: STC SH06-24 Issue #4

Nathalie,

1) Je suis désolé pour cette erreur sur le MDL du AS350, par contre la mention "or later Transport canada approved revision" fait en sorte que le document HTC-MDL-BP-AS350/355-1000 Rev G est le dernier document approuvé.

2) *(extrait courriel)*

Est-ce la signature de Mirko qui fait foie de TC en tant que DAR?

Oui, lors de modifications mineures ne demandant pas d'ajustement au certificat.

3) Document de certification:

Les documents mentionnés dans votre courriel n'ont jamais été envoyé à aucun de nos clients. Ces documents mentionnent nos façon de faire en certification, test en vol et analyse de structure. Par contre, la MDL signé fait office de preuve que ces documents existent. De, plus nous devons transmettre tous ces documents à TC, alors ils ont une copie de tout.

(extrait courriel)

Allo Jean-François,

J'ai fait le tour de ma nouvelle MDL rev. D pour m'assurer que j'ai tout ce qu'il faut et je constate que j'ai de nouvelles versions des documents suivants. Svp me confirmer si je dois les recevoir? Si non, m'émettre Aviatech qui confirme que ces documents ont réellement été faits et qu'ils sont conservés entre vos mains. Consultation par TC/FAA si néc?

- 1) AAC-CPL-BP-R44-1000 REV A, Aug 28, 2013
- 2) ATS-0709-FTP-1000 REV NC, Aug 27, 2013
- 3) ATS-0709-TM-1000 REV NC, Aug 9, 2013

Bonne journée.

Transport Canada

Date: August 28, 2013

***Statement of Conformity
With Certification Basis***

Approval # Q-SH06-24 Issue #4

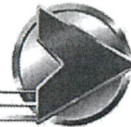
Model No

Type of equipment

R44, R44 II, R66, AS 350 D,
AS 350 B, AS 350 B1, AS 350
B2, AS 350 B3, AS 350 BA,
EC 130 B4, AS 355 E, AS 355
F, AS 355 F1, AS 355 F2, AS
355 N

BearPaw

Aviatech
TECHNICAL SERVICES^{INC}



Statement of Conformity

As the applicant to the modification approved under the STC Q-SH06-24 Issue #4, I hereby declare that the modifications listed above and defined in the following Master Document Lists:

For the R44 Series and R66:

HTC-MDL-BP-R44-1000, Revision D dated August 28, 2013

For the AS350 and AS355 Series:

HTC-MDL-BP-AS350/355-1000, Revision G dated December 21, 2012

For the EC130 - B4:

HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011

are conform to the best of my knowledge with its certification basis established by the Minister.

Signature:


Mirko Zgela (DAR#310)

On behalf of:

Helitowcart

Position title:

President

Company/Organization:

Aviatech Technical Services Inc



(Continuation Sheet)

Number: SH06-24 Issue 4

NOTE: THIS ADDENDUM SHALL REMAIN PART OF THE CERTIFICATE REFERRED TO THEREIN.

Installation/Operating Data,
Required Equipment and Limitations (Cont'd):

ERREUR.
LAISSER T.P.
- voir p. suivante -

For the Eurocopter (formerly Aerospatiale) AS350 and AS355 Series Helicopters:

Installation of Helitowcart Bear Paw BP350 is to be performed in accordance with TC approved Helitowcart Master Document List Report: HTC-MDL-BP-AS350/355-1000, Revision F dated April 8, 2010, or later Transport Canada approved revision.

Rev. G = OK.

G Dec 21, 2012

The BearPaw must be installed in accordance with Helitowcart Document: 314-0020-00-E, BearPaw Model BP350, Installation Instructions - AS350/355, Revision F dated December 21, 2012 or later Transport Canada approved revision.

For the Eurocopter EC 130 Helicopters:

Installation of Helitowcart Bear Paw BP130 is to be performed in accordance with TC approved Helitowcart Master Document List Report: HTC-MDL-BP-EC130-1000, Revision A dated May 13, 2011, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Document: 314-0031-00-A, BearPaw Model BP130, Installation Instructions - EC130, Revision A dated May 04, 2011 or later Transport Canada approved revision.

Fleet Eligibility List		
Make	Model	Type Certificate Data Sheet
Robinson	R44	H-97
Robinson	R44 II	H-97
Robinson	R66	H-111
Eurocopter	AS 350 B	H-83
Eurocopter	AS 350 B1	H-83
Eurocopter	AS 350 B2	H-83
Eurocopter	AS 350 B3	H-83
Eurocopter	AS 350 BA	H-83
Eurocopter	AS 350 D	H-83
Eurocopter	EC 130 B4	H-83
Eurocopter	AS 355 E	H-87
Eurocopter	AS 355 F	H-87
Eurocopter	AS 355 F1	H-87
Eurocopter	AS 355 F2	H-87
Eurocopter	AS 355 N	H-87

- End -



Transport Canada Transports Canada

Department of Transport

Supplemental Type Certificate

This approval is issued to:

Helitowcart (Vanair Inc.)
877A, Alphonse-Desrochers
St-Nicholas, Lévis, Québec
Canada G7A 5K6

Number: SH06-24

Issue No.: 4

Approval Date: August 17, 2006

Issue Date: October 10, 2013

Responsible Office:

Québec

Aircraft/Engine Type or Model:

See Continuation Sheet or

Canadian Type Certificate or Equivalent:

See Continuation Sheet or

Description of Type Design Change:

Installation of Helitowcar

Installation/Operating Data,

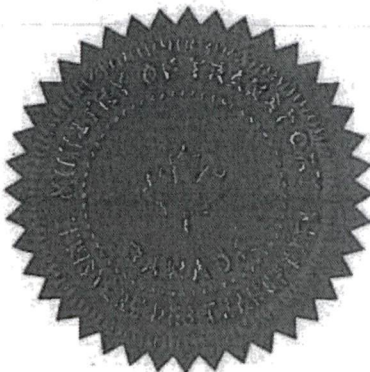
Required Equipment and Limitations:

For the Robinson Models R44, R44 II and R66 Helicopters:

Installation of Helitowcart Bear Paw BP44 is to be performed in accordance with TC approved Helitowcart Master Document List Report: HTC-MDL-BP-R44-1000, Revision D dated August 28, 2013, or later Transport Canada approved revision.

The BearPaw must be installed in accordance with Helitowcart Document: 314-0011-00, BearPaw Model BP44, Installation Instructions - R44/R66, Revision E dated August 09, 2013 or later Transport Canada approved revision.

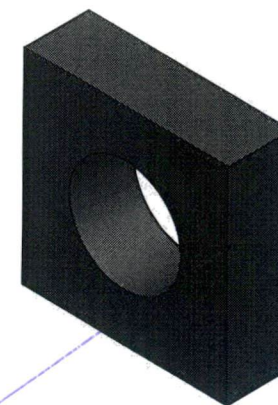
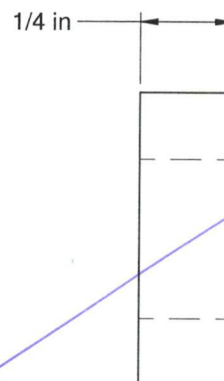
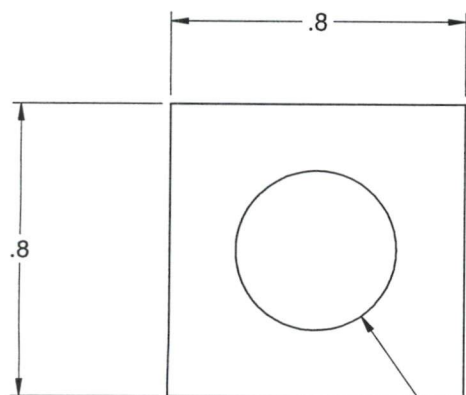
See Continuation Sheet Page 2 of 2



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the modified product.

Jean-Pierre Francoeur
For Minister of Transport

Canada



1/4 in DB
~~Ø 7/16 in~~
2008.03.12

R01	Initial issue	08-08-06	G.L.
Rev.	Description	Date	By

TOLERANCES

1/X ± 1/32"
 X.XX ± 0.010"
 X.XXX ± 0.005"
 ANGLE ± 1°

PROJECTION:

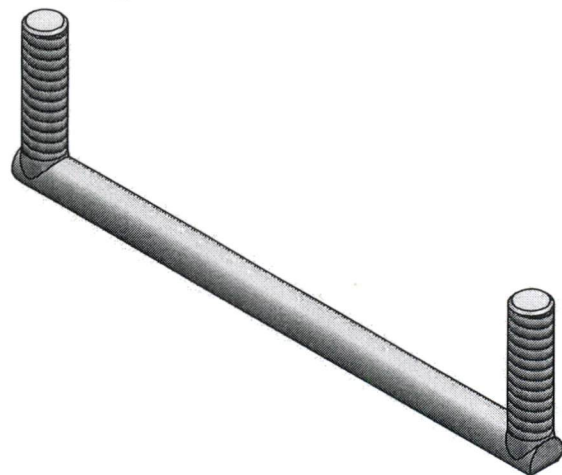


Vanair inc.
 860, Marie-Victorin
 St-Nicolas, Lévis (Québec)
 Canada, G7A 3S9
 Tél. : (418) 561-4512
 Fax : (418) 836-2291
www.helitowcart.com

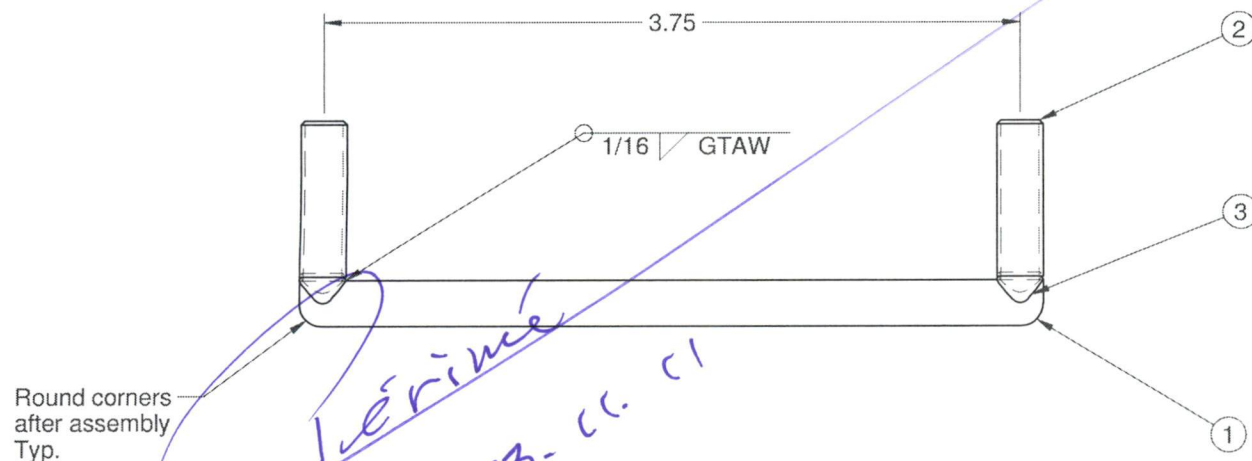
THIS DOCUMENT IS
 PROPERTY OF VANAIR
 INC. WRITTEN
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Titre / Title Bearpaw - Filler Block 1/4"		Matériel / Material: UHMW	
Dessiné par / Drawing by: G. Lapointe	Date: (yyyy-mm-dd) 2006-08-08	Format : A	Échelle / Scale: 1 : 1
Vérifié par / Checked by:	Date: (yyyy-mm-dd)	Numéro dessin / Drawing Number: VNR099	Page #: 1 de 1
Approuvé par / Approved by: <i>N. Carlier</i>	Date: (yyyy-mm-dd) 2006.09.07	Numéro de pièce / Part Number: 314-0012-01-A	Rev. #: R01

314-0012-01-A



N°	Qty:	Description	BOL #
1*	1	Bearpaw - Iceblade	314-0002-15-A
2*	2	Bearpaw - Iceblade threaded rod	314-0004-15-A
3*	2	Filler Material AWS A-5.9 / ASME SFA-5.9	MGSS308L

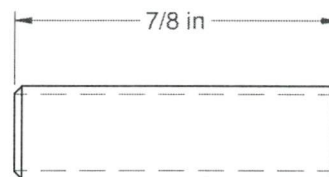
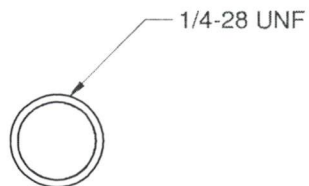


Rev.	Description	Date	By
R1	Initial issue	03-08-06	G.L.

TOLERANCES
1/X \pm 1/32"
X.XX \pm 0.010"
X.XXX \pm 0.005"
ANGLE \pm 1°
PROJECTION:

		Vanair inc. 860, Marie-Victorin St-Nicolas, Lévis (Québec) Canada, G7A 3S9 Tél. : (418) 561-4512 Fax : (418) 836-2291 www.helitowcart.com		THIS DOCUMENT IS PROPERTY OF VANAIR INC. WRITTEN PERMISSION FROM VANAIR INC. SHALL BE OBTAINED PRIOR TO COPYING, USING OR MODIFYING.	
		Titre / Title: Bearpaw - Iceblade assembly			
Dessiné par / Drawing by: G. Lapointe		Date: (yyyy-mm-dd) 2006-04-24	Format: A	Echelle / Scale: N/A	Page #: 1 de 1
Vérifié par / Checked by:		Date: (yyyy-mm-dd)	Numéro dessin / Drawing Number: VNR086		Rev. #: R1
Approuvé par / Approved by: 		Date: (yyyy-mm-dd) 2006-05-10	Numéro de pièce / Part Number: 314-0005-15-A		Rev. #:

314-0005-15-A



Break corner
(Sanding)
Typ.

*1 érivité
2013-01-01*

Note :
Raw material specification :
Stainless steel 304 annealed
Threaded rod 1/4-28 UNF

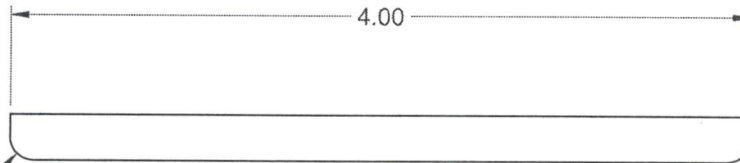
R1	Initial issue	03-08-06	G.L.
Rev.	Description	Date	By

TOLERANCES
1/X ± 1/32"
X.XX ± 0.010"
X.XXX ± 0.005"
ANGLE ± 1°
PROJECTION:

		Vanair inc. 860, Marie-Victorin St-Nicolas, Lévis (Québec) Canada, G7A 3S9 Tél. : (418) 561-4512 Fax : (418) 836-2291 www.helitowcart.com		THIS DOCUMENT IS PROPERTY OF VANAIR INC. WRITTEN PERMISSION FROM VANAIR INC. SHALL BE OBTAINED PRIOR TO COPYING, USING OR MODIFYING.	
		Titre / Title: Bearpaw - Iceblade threaded rod Matériel / Material: See Note			
Dessiné par / Drawing by: G. Lapointe		Date: (yyyy-mm-dd) 2006-04-24	Format : A	Échelle / Scale: N/A	Page #: 1 de 1
Vérifié par / Checked by:		Date: (yyyy-mm-dd)	Numéro dessin / Drawing Number: VNR085		Rev.#: R1
Approuvé par / Approved by: <i>S. Saurin</i>		Date: (yyyy-mm-dd) 2006.03.16	Numéro de pièce / Part Number: 314-0004-15-A		Rev.#:

314-0004-15 A

Round corners
after assembly
Typ.



Ø 1/4 in
Raw material

*Revised - (Removed from BP350 DMR)
2013.11.11
Change originated when iceblade
updated for BP44*

Note :
Raw material specification :
Stainless steel 304 annealed
Rod



Vanair inc.
860, Marie-Victorin
St-Nicolas, Lévis (Québec)
Canada, G7A 3S9
Tél. : (418) 561-4512
Fax : (418) 836-2291
www.helitowcart.com

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R1	Initial issue	03-08-06	G.L.
Rev.	Description	Date	By

TOLERANCES		Titre / Title Bearpaw - Iceblade		Matériel / Material: See Note	
1/X ± 1/32"		Dessiné par / Drawing by: G. Lapointe		Date: (yyyy-mm-dd) 2006-04-24	
X.XX ± 0.010"		Vérifié par / Checked by:		Format: A	
X.XXX ± 0.005"		Date: (yyyy-mm-dd)		Échelle / Scale: 1:1	
ANGLE ± 1°		Date: (yyyy-mm-dd)		Page #: 1 de 1	
PROJECTION:		Approuvé par / Approved by: <i>S. P. L.</i>		Numéro dessin / Drawing Number: VNR084	
		Date: (yyyy-mm-dd) 2006.03.10		Rev.#: R1	
				Numéro de pièce / Part Number: 314-0002-15-A	
				Rev.#:	

314-0002-15-A

NOTE: ICEBLADE & 1/4" FILLER
BLOCK

WHEN THE DWGS FOR THESE PARTS
WERE UPDATED TO REV. B IN 2013
FOR THE BP44, THE WERE NOT
DISTRIBUTED TO THE DMR &
MDL OF THE BP350 WHICH
+BP130
USES THE SAME PART.

THESE ARE THE OUTDATED
COPIES REMOVED FROM THE
DMR OF BP350 & BP130

NOTE: (ii) MDL REV. H SHALL BE
CORRECTED TO SHOW REV "B"
IN SECT. 90 MASTER DWGS, P. 2/3.
AT NEXT UPDATE.

1.0 MASTER DOCUMENTS

Document #	Title	Revision Status	Approval by	Date
✓ AAC-CPL-BP-AS350/355/EC130-1000*	Compliance Plan – Eurocopter Model AS350/355/EC130 Series Helicopters – Installation of BearPaw Model BP350 and BP130	B	DAR 310	May 11, 2011
✓ HTC-314-0020-00-E	BearPaw Model BP350 – Installation Instruction – AS350/355 Series Helicopters	G	DAR 310	May 30, 2016
AAC-STR-BP-AS350/355-1000*	Structural Substantiation – Helitowcart Inc. BearPaw Model BP350	NC	DAR 310	Nov 20, 2006
AAC-FTR-C-GZNC*	Simple External Modification – Applicant's Flight Test Plan/Report	NC	DAR 310	Nov 21, 2006
✓ HTS-EO-0709-002	Bear Paw Model BP350 Vent Holes	A	DAR 310	July 31, 2008
✓ HTC-MEM-0709-001	Memorandum – Vent Hole BP350 BearPaw	A	DAR 310	July 31, 2008
HTC-TM-0709-001*	Structural Substantiation – BearPaw Streamline BP350 with Recesses Wear Pads	NC	DAR 310	May 30, 2016

2.0 MASTER DRAWINGS

Drawings #	Title	Revision Status	Approval by	Date
112-0002-00	BearPaw BP350 - Assembly	B	DAR 310	Nov 20, 2006
112-0002-00-S	BearPaw BP350 – Assembly Streamline	E	DAR 310	May 30, 2016
314-0002-15 (VNR084)	BearPaw – Iceblade	A (R01)	DAR 310	Aug 9, 2013 Apr 24, 2006
314-0004-15 (VNR085)	BearPaw – Iceblade Threaded Rod	A (R01)	DAR 310	Aug 9, 2013 Apr 24, 2006
314-0005-15 (VNR086)	BearPaw – Iceblade Assembly	A (R01)	DAR 310	Aug 9, 2013 Apr 24, 2006
314-0007-15 (VNR089)	Bearpaw – Slotted Clip Support	B (R04)	DAR 310	July 31, 2006
314-0012-01 (VNR099)	Filler Block 1/4"	A (R01)	DAR 310	Aug 9, 2013 Aug 8, 2006
314-0018-01 (VNR106)	BearPaw BP350 - Pad	B (R02)	DAR 310	Sept 26, 2006
314-0018-01-S (VNR106-S)	BearPaw BP350 – Pad Streamline	E	DAR 310	May 30, 2016
314-0019-15 (VNR107)	BearPaw BP350 – U Shaped Clip	A (R01)	DAR 310	Sept 29, 2006

Now Revision B
2017-03-29 (mpc)

Page 2/3

* in the hands of MIRO ZGEH ONLY.
d JC

Master Document List

Helitowcart

Eurocopter Model AS 350/355 Series Helicopters Installation of BearPaw Model BP350

Report: HTC-MDL-BP-AS350/355-1000 (Rev H)

APPROVED BY:


Mirko Zgela
Design Approval Representative DAR #310

DATE: MAY 30, 2016

Revision	Revision Date	Revision of Entry	Entered by
A	Nov 22, 2006	Initial issue	N/A
B	Jan 28, 2007	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
C	Feb 28, 2007	Addition of streamline pad configuration. Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
D	July 27, 2008	Addition of vents holes in the streamline pad.	M.Z.
E	Aug 01, 2008	Modification of vents holes in the streamline pad.	M.Z.
F	April 8, 2010	Revision performed to the Installation Instructions (Doc # HTC-314-0020-00)	M.Z.
G	December 21, 2012	Updated Tolerance data regarding Pad and Updated referenced document identification and revisions	M.Z.
H	May 30, 2016	Added recesses for skid wear shoes and leaf spring on streamline BearPaw (Dwg # 314-0018-01-S) and allowed trimming/machining of recesses on previous models provided the relief leaves at least 0.500" thickness	M.Z.

In next update:

- Change Iceblade Assembly Rev from A \rightarrow B

MPC \rightarrow 2017-03-29

- Revoir model numbers pour les washers & nuts des iceblades

features an easy thru-bolt installation that makes installation or replacement quick and easy, eliminates clamps over the skidtube and prevents the wearplate from rotating on the skidtube. The DART Aerospace run-on landing wearplate is LH/RH interchangeable, which reduces spares inventory. The Run-on landing wearplate is installed at the factory, eliminating the need to source from several vendors and the additional costs for separate shipping and on-site installation. The run-on landing wearplate is installed with a corrosion resistant compound between the skidtube and wearplate (no gaskets or sealant required).

OEM CROSS-REFERENCE

ADDITIONAL INFORMATION

WEIGHT 32.50 lbs / 14.74 kg

INSTALLATION TIME 2 hrs

APPROVALS

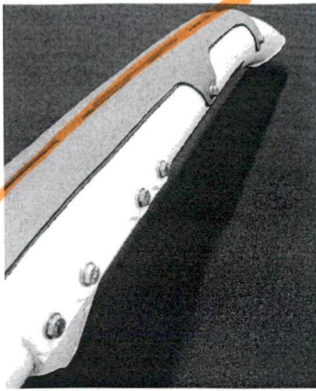
APPROVAL	STC NUMBER	AC APPROVED	STC DESCRIPTION
STC	EASA - Europe	10033942	AS350B/AS350B1/AS350B2/AS350B3/AS350BA/AS350D/AS355E/AS355F/AS355F1/AS355F2/AS355N/AS355NP
STC	ANAC - Brazil	2009S05-01	AS350B/AS350B1/AS350B2/AS350B3/AS350BA/AS355F/AS355F1/AS355F2/AS355N
STC	TCCA - Canada	SH99-7	AS350B/AS350B1/AS350B2/AS350B3/AS350BA/AS350D/AS355E/AS355F/AS355F1/AS355F2/AS355N/AS355NP
STC	FAA - USA	SR00646SE	AS350B/AS350B1/AS350B2/AS350B3/AS350BA/AS350D/AS355E/AS355F/AS355F1/AS355F2/AS355N/AS355NP
PMA	FAA - USA	PQ2021NM Supplement No 2	AS350B/AS350B1/AS350B2/AS350B3/AS350BA/AS350D/AS355E/AS355F/AS355F1/AS355F2/AS355N/AS355NP

Consider
in future
design change

NOTE: THE ECO DOES NOT COVER A CHANGE TO FIT THIS DART OPTION

HOME / / SKIDTUBE RH, RUN-ON LANDING, DART (APICAL) TRI-BAG/AIR CRUISERS FLOAT COMP.

DART
AEROSPACE



D350-636-018

**Skidtube RH, Run-on Landing,
DART (Apical) Tri-Bag/Air Cruisers
Float Comp.**

AIRCRAFT MODELS AS355/AS350

LIST PRICE (USD)

\$7,070.00

STD
≠ WEAR
SHOE

I-BEAM WOULD REQUIRE

NEW
U-SLOT
ON SKID

KEY FEATURES

• Repairable/weldable • Comes complete with Run-on Landing Wearplates already installed • Patented I-beam construction • Thru-bolt wearplate installation - no clamping • Blade included • Pre-drilled for float compatibility

KEY BENEFITS

• 10 times more resistant to crushing due to I-beam construction • One-stop-shop - single supplier for skid tubes and Run-on Landing Wearplates • Run-on Landing Skid tubes are ideal for training operations • Compatible with DART and OEM Crosstubes

PRODUCT DESCRIPTION

Comes complete with 1 full-length stainless steel run-on landing wearplate & blade. Thru-bolt wearplate installation. Predrilled for compatibility with Air Cruisers / DART (Apical) Tri-Bag Floats. Compatible with DART & OEM Crosstubes.

GENERAL INFORMATION

We believe that conventional skid tubes are under-designed for the types of landings most helicopters encounter. Conventional skid tubes are ill-equipped to face the critical loading conditions encountered when landing on uneven ground. Under these conditions, simple round tubes tend to puncture, dent and bend because they cannot maintain their shape. DART Aerospace's revolutionary patented Round-I-Beam™ technology combines the conventional round tube with the strength of the I-beam made from 6061-T6 aluminum. In DART Aerospace skid tubes, the central I-beam web absorbs most of the impact on landing so the tube maintains its integrity. Even with the addition of a central web, the weight is comparable to that of conventional skid tubes. DART run-on landing wearplate features 1 full-length stainless steel wear bar with more areas of generously overlaid highly wear resistant tungsten carbide as compared to any other available wearplates. The run-on landing wearplate is constructed of stainless steel and

DART AEROSPACE

1270 Aberdeen Street Hawkesbury, Ontario, Canada K6A 1K7

<http://www.dartaerospace.com/skidtube-rh-run-on-landing-dart-apical-tri-bag-air-cruisers-float-comp?search=result&cat=0&q=as350+skid&v>

BP350 - D4# feeding

- SUGGESTED/REQ'D UPDATES -